105-AMX

AMX SERIES

AC POWER SOURCE

OPERATION MANUAL

PACIFIC
POWER SOURCE

MP MASTER
MA36182

AMX-SERIES

OPERATION MANUAL

FOR THE

MODELS
105-AMX, 108-AMX
112-AMX, 125-AMX
140-AMX, 305-AMX
308-AMX, 312-AMX
320-AMX, 345-AMX
360-AMX, 390-AMX
3120-AMX

AND THE

UMC-31

PPSC PART NO. 139250

THIS MANUAL ASSIGNED TO THE MODEL _____

S/N _____

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PACIFIC POWER SOURCE,
A DIVISION OF THERMO VOLTEK CORPORATION,
A THERMO ELECTRON COMPANY
15122 BOLSA CHICA STREET
HUNTINGTON BEACH, CALIF. 92649

SECOND EDITION

October 1996

CERTIFICATION

Pacific Power Source certifies that this instrument was thoroughly tested and inspected and found to meet or exceed its published specifications when it was shipped from the factory.

LIMITED WARRANTY

Pacific Power Source (PPS) warrants each unit to be free from defects in material and workmanship. For the period of two (2) years from the date of shipment to the purchaser, PPS will either repair or replace, at its sole discretion, any unit returned to its factory in Huntington Beach, California. This warranty does not cover batteries. It does not cover damage arising from mis-use of the unit or attempted field modifications or repairs. This warranty specifically excludes damage to other equipment connected to this unit.

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This warranty is exclusive of all other warranties, express or implied.

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SECTION 1

GENERAL

1.0 GENERAL

This manual is written to provide the information required to use the AMX-Series AC Power Source. Operation of the Models 105-AMX, 108-AMX, 112-AMX, 125-AMX, 140-AMX, 305-AMX, 308-AMX, 312-AMX, 320-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX is described in this document.

This manual is an Operations Manual. Installation, operation, and calibration are the subjects covered by this manual.

1.1 USING THIS MANUAL

This manual provides instructions for installation and use of the AMX-Series Power Source equipment. For this reason, it is very important that the user reads sections 1, 3, and 4 prior to using this equipment. A thorough understanding of these sections is required to properly operate this equipment.

Section 2 states the specifications of the equipment. Knowledge of this information is required to gain maximum use of this equipment for a given application. The user is encouraged to read this section in order to gain a deeper understanding of the capabilities of the AMX-Series Power Source.

Sections 5 and 6 list maintenance and calibration requirements of this equipment. Refer to these sections when either maintenance or calibration is required.

Section 7 describes service methodology and provides system, sub-assembly, and component part numbers to aid the user in making *factory authorized* field repairs.

This equipment is configured with a modular controller. This allows for the creation of systems with various control characteristics and specifications. This manual describes the operation of the basic power source. Detailed information relative to the UMC-31 Controller is also included is described in Section 8 of this manual. The UPC controllers are described in a separate manual. Refer to the ***UPC-Series Operation Manual*** for such information.

Section 9 contains product change notices, errata and data relative to customer specified modifications. Always read this section before operating the equipment. This is especially true when modifications have been installed, since these can change system operation.

If questions arise while reading this manual, the user is encouraged to call the Pacific Power Source. Pacific maintains a toll-free number which is 1-800-854-2433 (1-800-472-8465 inside California).

1.2 SAFETY NOTICES

The AMX-Series equipment is capable of transferring very large amounts of electrical energy very quickly. This basic quality is fundamental to a high-performance power source. The warnings and cautions listed below should be observed at all times.

WARNINGS are conditions which are hazardous to user personnel. All warnings throughout this manual will be formatted as shown below. A condition which is hazardous to both personnel and equipment will be issued as a warning.

CAUTION statements indicate a dangerous situation which may damage the equipment but is not a threat to life or limb. Cautions will assume the format shown opposite. All cautions should be rigorously observed

* * * **WARNING** * * *

• THIS EQUIPMENT CONTAINS HIGH-ENERGY, LOW-IMPEDANCE CIRCUITS !!

LETHAL POTENTIALS ARE CONTAINED WITHIN THE SYSTEM.

•CARE MUST BE EXERCISED WHEN SERVICING THIS EQUIPMENT IN ORDER TO PREVENT SERIOUS OPERATOR INJURY OR EQUIPMENT DAMAGE.

•OUTPUT VOLTAGE RESPONDS *INSTANTLY* WHEN THE POSITION OF THE OUTPUT COUPLING SWITCH IS CHANGED.

LOAD MAY BE DAMAGED DUE TO DOUBLING OF OUTPUT VOLTAGE.

- ALWAYS MAKE SURE THAT THE OUTPUT ON/OFF SWITCH IS IN THE **OFF** POSITION BEFORE CHANGING THE OUTPUT COUPLING MODE.

* * * **WARNING** * * *

1.2 SAFETY NOTICES (cont.)

* * * WARNING * * *

- OBSERVE THE FOLLOWING WHEN SERVICE AND MAINTENANCE ARE REQUIRED:

  1) REMOVE ALL JEWELRY FROM ARMS AND NECK WHEN SERVICING THIS EQUIPMENT. THIS PREVENTS THE POSSIBILITY OF SHORTING THROUGH THE JEWELRY AND CAUSING BURNS TO OR ELECTROCUTION OF THE OPERATOR.

  2) **WEAR SAFETY GLASSES** WHEN SERVICING THIS EQUIPMENT TO PREVENT EYE INJURY DUE TO FLYING PARTICLES CAUSED BY ACCIDENTAL SHORT CIRCUIT CONDITIONS.

  3) DO NOT REMOVE ANY PANELS OR COVERS WITHOUT FIRST OPENING **ALL** CIRCUIT BREAKERS AND THEN REMOVING THE INPUT SERVICE.

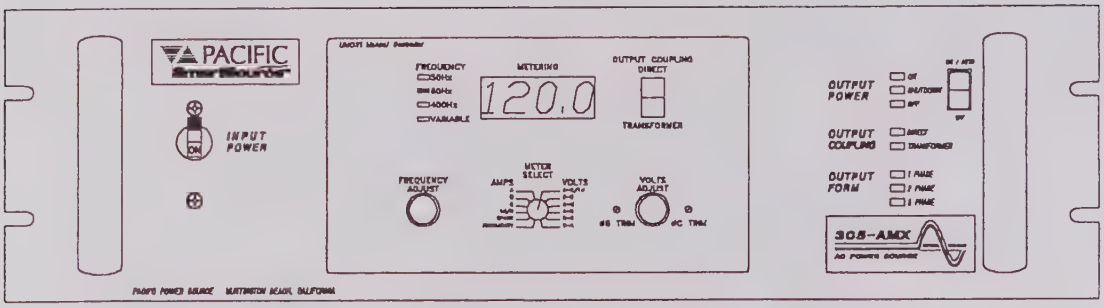
  4) SERVICE OTHER THAN CLEANING FILTERS AND CALIBRATION SHOULD BE REFERRED TO PERSONNEL AUTHORIZED BY THE FACTORY TO SERVICE THIS EQUIPMENT.

* * * WARNING * * *

- - - CAUTION - - -

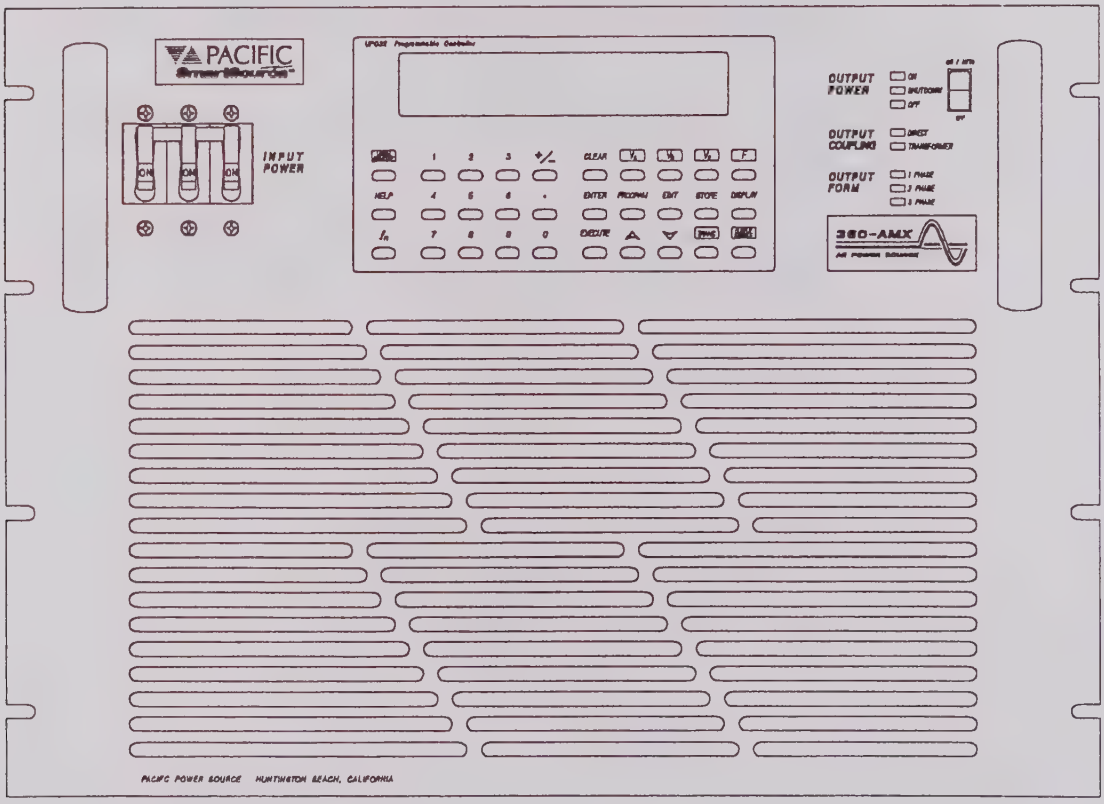
READ SECTIONS 1, 3, AND 4 OF THIS MANUAL BEFORE INSTALLING OR OPERATING THIS EQUIPMENT.

- - - CAUTION - - -



MODEL 305-AMX

W/ UMC-31 CONTROLLER



MODEL 360-AMX

W/ UPC-32 CONTROLLER

FIGURE 1.3

1.3 GENERAL PRODUCT DESCRIPTION

The AMX-Series Power Source is high-performance AC power conversion equipment. This series of equipment features models with power ratings from 500 VA to 12 kVA. All systems are designed to fit into the standard 19 inch rack. These systems are suitable for use as frequency changers as well as sophisticated test power generators.

All systems are configured with an interchangeable controller. Controller options range from the basic manual type (UMC-Series) to the sophisticated programmable controller (UPC-Series). The manual controller allows the user to adjust voltage and frequency. The programmable controller, on the other hand, not only allows control of voltage and frequency, but also allows the user to simulate virtually any transient (including sub-cycle waveform disturbance) required for testing today's modern electronic equipment.

The standard output voltage range of the AMX-Series is 0-135 $VAC_{l\text{-}n}$ (0-150 $VAC_{l\text{-}n}$ for the Model 125-AMX). Additionally, the Models 112-AMX and 312-AMX can be configured for several output voltage ranges between and including 0-110 $VAC_{l\text{-}n}$ and 0-150 $VAC_{l\text{-}n}$. Optional output transformers are available to provide higher voltages. Voltage ratios up to 2.5:1 are available.

The AMX-Series consists of the basic models listed below:

1. **Model 105-AMX** - 500 VA Chassis capable of 1 or 2 Phase operation. Standard Output voltage range is 0-135 $VAC_{l\text{-}n}$, 1ϕ or 0-270 VAC, 2 Phase. Phase separation fixed at 180° when operating in 2 Phase Mode.

2. **Model 108-AMX** - Same as 105-AMX, but rated for 750 VA output power.

3. **Model 112-AMX** - Same as 105-AMX, but rated for 1.2 kVA output power. Standard Output voltage ranges are 0-110 $VAC_{l\text{-}n}$ through 0-150 $VAC_{l\text{-}n}$, 1ϕ or 0-220 VAC through 0-300 VAC, 2 Phase.

4. **Model 125-AMX** - Same as 105-AMX, but rated for 2.5 kVA output power. Standard Output voltage range is 0-150 $VAC_{l\text{-}n}$, 1ϕ or 0-300 VAC, 2 Phase.

5. **Model 140-AMX** - Same as 105-AMX, but rated for 4.0 kVA output power.

6. **Model 305-AMX** - 500 VA Chassis capable of 1, 2, or 3 Phase operation. Standard Output voltage range is 0-135 $VAC_{l\text{-}n}$. Phase separation fixed at 180° when operating in 2 Phase Mode. In 3 Phase Mode, phase separation is fixed at 120° or programmable.

7. **Model 308-AMX** - Same as 305-AMX, but rated for 750 VA output power.

8. **Model 312-AMX** - Same as 305-AMX, but rated for 1.2 kVA output power. Standard Output voltage ranges are 0-110 $VAC_{l\text{-}n}$ through 0-150 $VAC_{l\text{-}n}$, 1ϕ or 0-220 VAC through 0-300 VAC, 2 Phase.

9 **Model 320-AMX** - Same as 305-AMX, but rated for 2.25 kVA output power.

10. **Model 345-AMX** - Same as 305-AMX, but rated for 4.5 kVA output power.

11. **Model 360-AMX** - Same as 305-AMX, but rated for 6.0 kVA output power.

1.3 GENERAL PRODUCT DESCRIPTION (cont.)

12. **Model 390-AMX** - Same as 305-AMX, but rated for 9.0 kVA output power.

13. **Model 3120-AMX** - Same as 305-AMX, but rated for 12.0 kVA output power.

External voltage sense is provided on all systems. Systems configured with the programmable controller also feature Continuous Self Calibration (CSC).

Output voltage and current metering is provided on all systems. Specifications of the metering functions vary by controller type. Refer to Section 8 or the *UPC-Series Operation Manual*, as appropriate, for details relative to the metering functions.

SECTION 2

SPECIFICATIONS

2.0 SPECIFICATIONS

This section states the electrical specifications of the AMX-Series Power Source. The specifications listed apply to all models, except as noted. Some specifications are controller dependent. These are noted as such.

2.1 ELECTRICAL SPECIFICATIONS

2.1.1 INPUT POWER REQUIREMENTS

This paragraph lists and defines the input voltage forms that are accepted by the various models within the AMX-Series line of equipment. Each model is listed separately. Refer to the appropriate model when determining proper input service requirements. The input currents listed are those for operation at full rated load. Overload conditions will result in higher input currents that still fall within the recommended input service.

The input power transformer of the AMX-Series Power Source has taps for each of the listed power forms - one of which is selected by the factory at time of order. Once selected, the unit will operate at designated voltage, $\pm 10\%$.

MODEL 105-AMX

INPUT VOLTAGE
The Model 105-AMX accepts one of the following single phase input voltages:

1)	110 VAC $\pm 10\%$, 47-63 Hz	(360-440 Hz optional)
2)	120 VAC $\pm 10\%$, 47-63 Hz	(360-440 Hz optional)
3)	220 VAC $\pm 10\%$, 47-63 Hz	(360-440 Hz optional)
4)	230 VAC $\pm 10\%$, 47-63 Hz	(360-440 Hz optional)
5)	240 VAC $\pm 10\%$, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT
The input current required by the Model 105-AMX at full rated load is stated below. Recommended input service is also stated.

	V_{in}	INPUT CURRENT
1)	110 VAC	9 A_{rms}; 20 A Service Recommended
2)	120 VAC	8 A_{rms}; 20 A Service Recommended
3)	220 VAC	5 A_{rms}; 15 A Service Recommended
4)	230 VAC	4 A_{rms}; 15 A Service Recommended
5)	240 VAC	4 A_{rms}; 15 A Service Recommended

2.1.1 INPUT POWER REQUIREMENTS (cont.)

MODEL 108-AMX

INPUT VOLTAGE

The Model 108-AMX accepts one of the following single phase input voltages:

1)	110 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
2)	120 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
3)	220 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
4)	230 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
5)	240 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT

The input current required by the Model 108-AMX at full rated load is stated below. Recommended input service is also stated.

	V_{in}	INPUT CURRENT
1)	110 VAC	14 A_{rms}; 20 A Service Recommended
2)	120 VAC	13 A_{rms}; 20 A Service Recommended
3)	220 VAC	7 A_{rms}; 15 A Service Recommended
4)	230 VAC	7 A_{rms}; 15 A Service Recommended
5)	240 VAC	6 A_{rms}; 15 A Service Recommended

MODEL 112-AMX

INPUT VOLTAGE

The Model 112-AMX accepts one of the following single phase input voltages:

1)	100 VAC ±10%, 47-63 Hz
2)	110 VAC ±10%, 47-63 Hz
3)	120 VAC ±10%, 47-63 Hz
4)	200 VAC ±10%, 47-63 Hz
5)	220 VAC ±10%, 47-63 Hz
6)	240 VAC ±10%, 47-63 Hz

INPUT CURRENT

The input current required by the Model 112-AMX at full rated load is stated below. Recommended input service is also stated.

	V_{in}	INPUT CURRENT
1)	100 VAC	20 A_{rms}; 25 A Service Recommended
2)	110 VAC	19 A_{rms}; 25 A Service Recommended
3)	120 VAC	18 A_{rms}; 25 A Service Recommended
4)	200 VAC	10 A_{rms}; 15 A Service Recommended
5)	220 VAC	9 A_{rms}; 15 A Service Recommended
6)	240 VAC	9 A_{rms}; 15 A Service Recommended

2.1.1 INPUT POWER REQUIREMENTS (cont.)

MODEL 125-AMX

INPUT VOLTAGE

The Model 125-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT

The input current required by the Model 125-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	12 A_{rms}; 20 A Service Recommended
	2)	220 VAC Δ	11 A_{rms}; 20 A Service Recommended
	3)	240 VAC Δ	10 A_{rms}; 20 A Service Recommended
	4)	220/380 VAC	6 A_{rms}; 10 A Service Recommended
	5)	240/416 VAC	6 A_{rms}; 10 A Service Recommended
(cost option)	6)	277/480 VAC	5 A_{rms}; 10 A Service Recommended

MODEL 140-AMX

INPUT VOLTAGE

The Model 140-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz cost option)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz cost option)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz cost option)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz cost option)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz cost option)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz cost option)

INPUT CURRENT

The input current required by the Model 140-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	21 A_{rms}; 30 A Service Recommended
	2)	220 VAC Δ	19 A_{rms}; 30 A Service Recommended
	3)	240 VAC Δ	18 A_{rms}; 30 A Service Recommended
	4)	220/380 VAC	12 A_{rms}; 20 A Service Recommended
	5)	240/416 VAC	11 A_{rms}; 20 A Service Recommended
(cost option)	6)	277/480 VAC	9 A_{rms}; 20 A Service Recommended

2.1.1 INPUT POWER REQUIREMENTS (cont.)

MODEL 305-AMX

INPUT VOLTAGE
The Model 305-AMX accepts one of the following single phase input voltages:

1)	110 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
2)	120 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
3)	220 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
4)	230 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
5)	240 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT
The input current required by the Model 305-AMX at full rated load is stated below. Recommended input service is also stated.

	V_{in}	INPUT CURRENT
1)	110 VAC	9 A_{rms}; 20 A Service Recommended
2)	120 VAC	8 A_{rms}; 20 A Service Recommended
3)	220 VAC	5 A_{rms}; 15 A Service Recommended
4)	230 VAC	4 A_{rms}; 15 A Service Recommended
5)	240 VAC	4 A_{rms}; 15 A Service Recommended

MODEL 308-AMX

INPUT VOLTAGE
The Model 308-AMX accepts one of the following single phase input voltages:

1)	110 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
2)	120 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
3)	220 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
4)	230 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
5)	240 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT
The input current required by the Model 308-AMX at full rated load is stated below. Recommended input service is also stated.

V_{in}		INPUT CURRENT
1)	110 VAC	14 A_{rms}; 20 A Service Recommended
2)	120 VAC	13 A_{rms}; 20 A Service Recommended
3)	220 VAC	7 A_{rms}; 15 A Service Recommended
4)	230 VAC	7 A_{rms}; 15 A Service Recommended
5)	240 VAC	6 A_{rms}; 15 A Service Recommended

2.1.1 INPUT POWER REQUIREMENTS (cont.)

MODEL 312-AMX

INPUT VOLTAGE
The Model 312-AMX accepts one of the following single phase input voltages:

1) 100 VAC ±10%, 47-63 Hz
2) 110 VAC ±10%, 47-63 Hz
3) 120 VAC ±10%, 47-63 Hz
4) 200 VAC ±10%, 47-63 Hz
5) 220 VAC ±10%, 47-63 Hz
6) 240 VAC ±10%, 47-63 Hz

INPUT CURRENT
The input current required by the Model 312-AMX at full rated load is stated below. Recommended input service is also stated.

	V_{in}	INPUT CURRENT
1)	100 VAC	20 A_{rms}; 25 A Service Recommended
2)	110 VAC	19 A_{rms}; 25 A Service Recommended
3)	120 VAC	18 A_{rms}; 25 A Service Recommended
4)	200 VAC	10 A_{rms}; 15 A Service Recommended
5)	220 VAC	9 A_{rms}; 15 A Service Recommended
6)	240 VAC	9 A_{rms}; 15 A Service Recommended

MODEL 320-AMX

INPUT VOLTAGE
The Model 320-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT
The input current required by the Model 320-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	11 A_{rms}; 20 A Service Recommended
	2)	220 VAC Δ	10 A_{rms}; 20 A Service Recommended
	3)	240 VAC Δ	9 A_{rms}; 20 A Service Recommended
	4)	220/380 VAC	6 A_{rms}; 10 A Service Recommended
	5)	240/416 VAC	5 A_{rms}; 10 A Service Recommended
(cost option)	6)	277/480 VAC	5 A_{rms}; 10 A Service Recommended

2.1.1 INPUT POWER REQUIREMENTS (cont.)

MODEL 345-AMX

INPUT VOLTAGE

The Model 345-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT

The input current required by the Model 345-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	21 A_{rms}; 30 A Service Recommended
	2)	220 VAC Δ	20 A_{rms}; 30 A Service Recommended
	3)	240 VAC Δ	18 A_{rms}; 30 A Service Recommended
	4)	220/380 VAC	12 A_{rms}; 20 A Service Recommended
	5)	240/416 VAC	11 A_{rms}; 20 A Service Recommended
(cost option)	6)	277/480 VAC	9 A_{rms}; 20 A Service Recommended

MODEL 360-AMX

INPUT VOLTAGE

The Model 360-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz cost option)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz cost option)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz cost option)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz cost option)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz cost option)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz cost option)

INPUT CURRENT

The input current required by the Model 360-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	31 A_{rms}; 40 A Service Recommended
	2)	220 VAC Δ	29 A_{rms}; 40 A Service Recommended
	3)	240 VAC Δ	27 A_{rms}; 40 A Service Recommended
	4)	220/380 VAC	17 A_{rms}; 20 A Service Recommended
	5)	240/416 VAC	16 A_{rms}; 20 A Service Recommended
(cost option)	6)	277/480 VAC	14 A_{rms}; 20 A Service Recommended

2.1.1 INPUT POWER REQUIREMENTS (cont.)

MODEL 390-AMX

INPUT VOLTAGE

The Model 390-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT

The input current required by the Model 390-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	42 A_{rms}; 60 A Service Recommended
	2)	220 VAC Δ	39 A_{rms}; 60 A Service Recommended
	3)	240 VAC Δ	36 A_{rms}; 60 A Service Recommended
	4)	220/380 VAC	23 A_{rms}; 40 A Service Recommended
	5)	240/416 VAC	21 A_{rms}; 40 A Service Recommended
(cost option)	6)	277/480 VAC	18 A_{rms}; 40 A Service Recommended

MODEL 3120-AMX

INPUT VOLTAGE

The Model 3120-AMX accepts one of the following three phase input voltages:

	1)	208 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	2)	220 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	3)	240 VAC Δ ±10%, 47-63 Hz	(360-440 Hz optional)
	4)	220/380 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
	5)	240/416 VAC ±10%, 47-63 Hz	(360-440 Hz optional)
(cost option)	6)	277/480 VAC ±10%, 47-63 Hz	(360-440 Hz optional)

INPUT CURRENT

The input current required by the Model 3120-AMX at full rated load is stated below. Recommended input service is also stated.

		V_{in}	INPUT CURRENT
	1)	208 VAC Δ	62 A_{rms}; 80 A Service Recommended
	2)	220 VAC Δ	58 A_{rms}; 80 A Service Recommended
	3)	240 VAC Δ	54 A_{rms}; 80 A Service Recommended
	4)	220/380 VAC	34 A_{rms}; 40 A Service Recommended
	5)	240/416 VAC	32 A_{rms}; 40 A Service Recommended
(cost option)	6)	277/480 VAC	28 A_{rms}; 40 A Service Recommended

2.1.2 OUTPUT POWER

OUTPUT VOLTAGE RANGE

DIRECT-COUPLED

The standard output voltage range of the AMX-Series Power Source is 0-135 VAC_{l-n} (0-150 VAC_{l-n} for the Model 125-AMX) when operated in the direct-coupled mode. Additionally, the Models 112-AMX and 312-AMX can be configured for several direct-coupled output voltage ranges between and including 0-110 VAC_{l-n} and 0-150 VAC_{l-n}. These voltages are stated for full rated load and nominal input voltage applied.

TRANSFORMER-COUPLED

The output voltage range of the AMX-Series Power Source varies when operated in the transformer-coupled mode. Maximum output voltage is determined by the transformer turns ratio. See list below for maximum output voltage vs. turns ratio.

TURNS RATIO	MAXIMUM OUTPUT VOLTAGE (No Load)
1.5:1	204 VAC_{l-n}
2.0:1	273 VAC_{l-n}
2.5:1	341 VAC_{l-n}

OUTPUT CURRENT

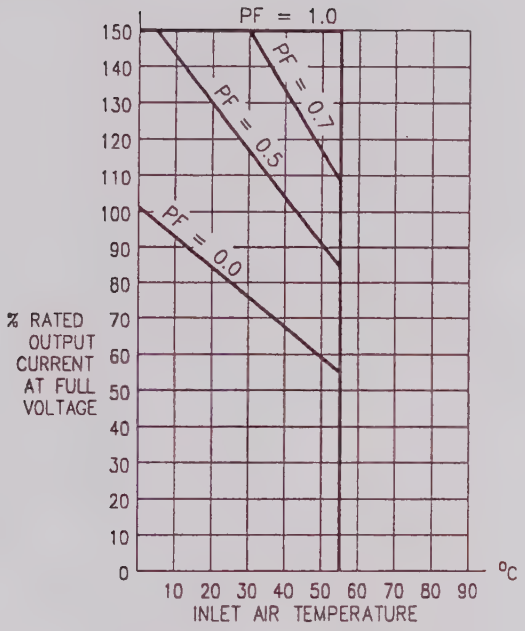
FULL-RATED CURRENT

The full-rated output current the AMX-Series Power Source is listed below by model number. Current stated for output voltage set to 125 VAC_{l-n}. Refer to the Power Factor Derating chart of Figure 2.1.2(A-N) for maximum current at reduced voltage. Output current ratings are scaled appropriately when using transformer-coupled outputs.

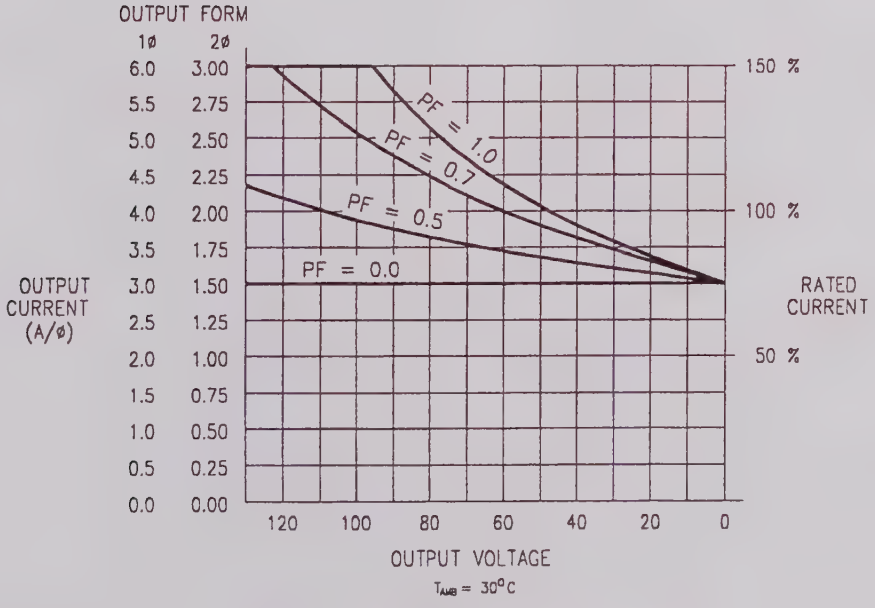
	1ϕ		2ϕ		3ϕ	
MODEL	$I_{out, rms}$	$I_{out, pk}$	$I_{out, rms}$	$I_{out, pk}$	$I_{out, rms}$	$I_{out, pk}$
105-AMX	4 A	40 A	2 A	20 A	N/A	N/A
108-AMX	6 A	40 A	3 A	20 A	N/A	N/A
112-AMX	10 A	40 A	5 A	20 A	N/A	N/A
125-AMX	20 A	90 A	10 A	45 A	N/A	N/A
140-AMX	32 A	140 A	16 A	70 A	N/A	N/A
305-AMX	4 A	45 A	2 A	15 A	1.33 A	15 A
308-AMX	6 A	45 A	2 A	15 A	2 A	15 A
312-AMX	10 A	45 A	3 A	15 A	3 A	15 A
320-AMX	18 A	60 A	6 A	20 A	6 A	20 A
345-AMX	36 A	165 A	12 A	55 A	12 A	55 A
360-AMX	48 A	210 A	16 A	70 A	16 A	70 A
390-AMX	72 A	330 A	24 A	110 A	24 A	110 A
3120-AMX	96 A	410 A	32 A	140 A	32 A	140 A

OVERLOAD OPERATION

The AMX-Series Power Source will deliver up to 150% of rated rms output current into unity power factor loads at full-rated output voltage. Low output power factor, reduced output voltage, and elevated ambient temperatures will increase the internal dissipation of the power source and can cause overload shutdown due to over-temperature conditions. Length of time to reach over-temperature varies with the models and the above parameters.

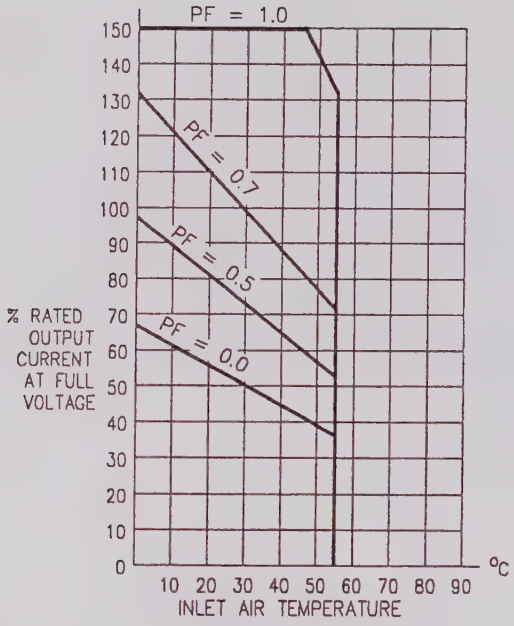


THERMAL DERATING CHART

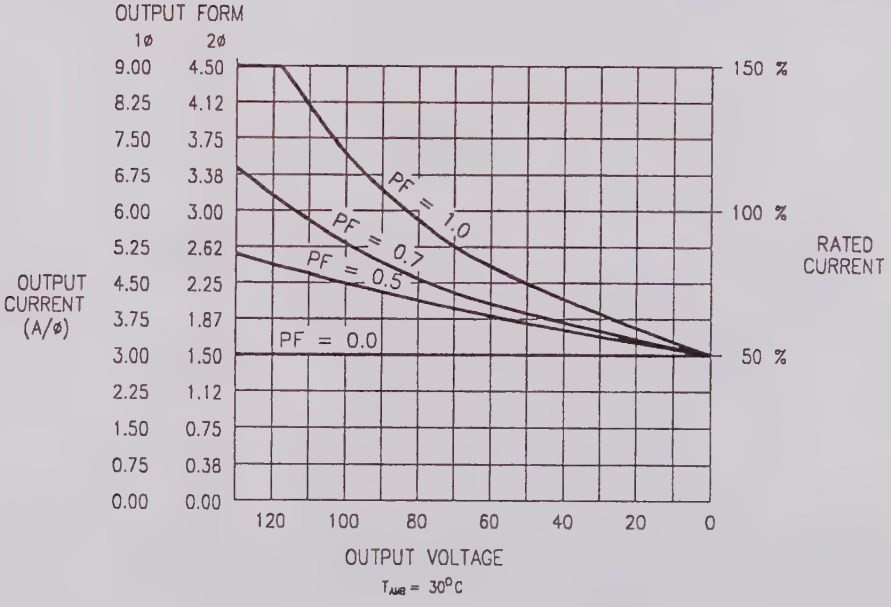


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(A) MODEL 105-AMX OUTPUT DERATING CURVES

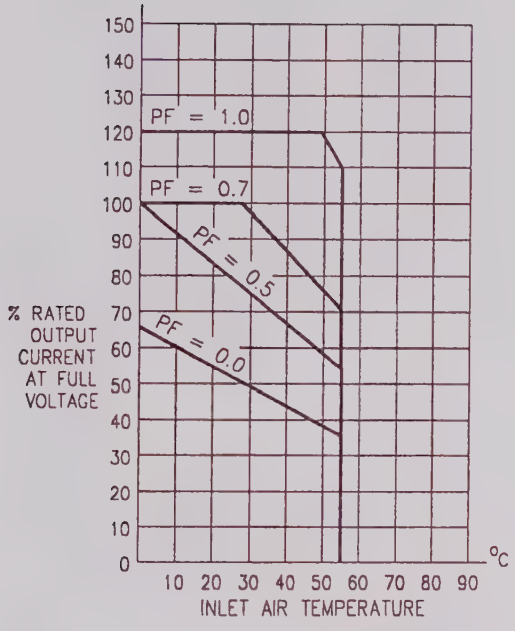


THERMAL DERATING CHART

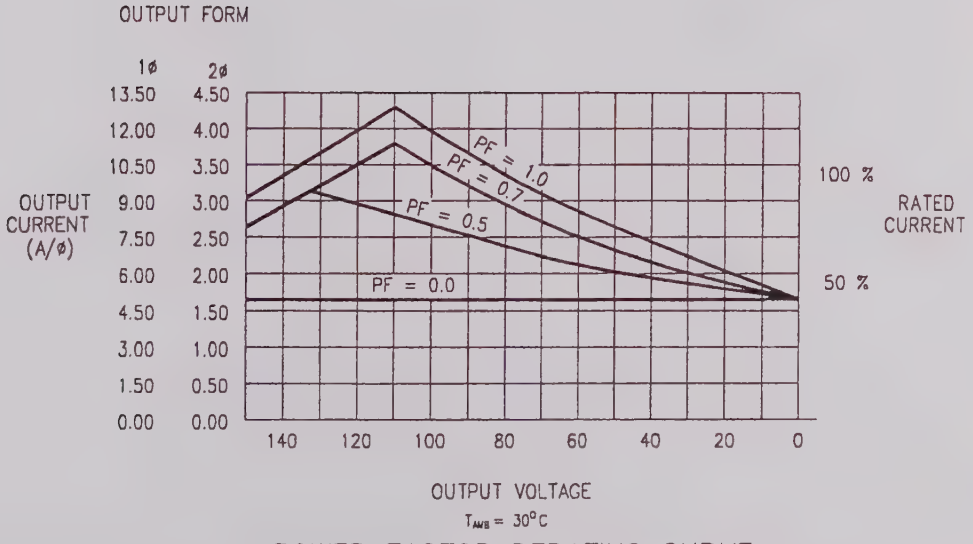


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(B) MODEL 108-AMX OUTPUT DERATING CURVES

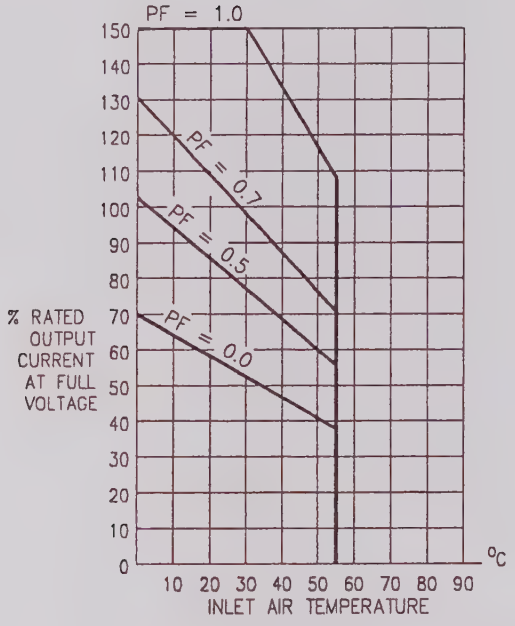


THERMAL DERATING CHART

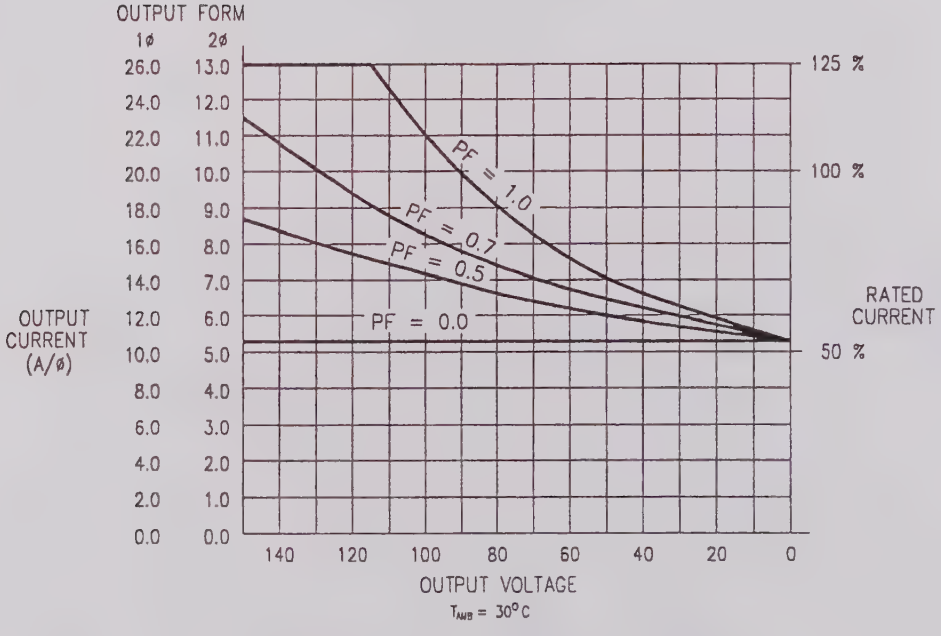


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(c) MODEL 112-AMX OUTPUT DERATING CURVES

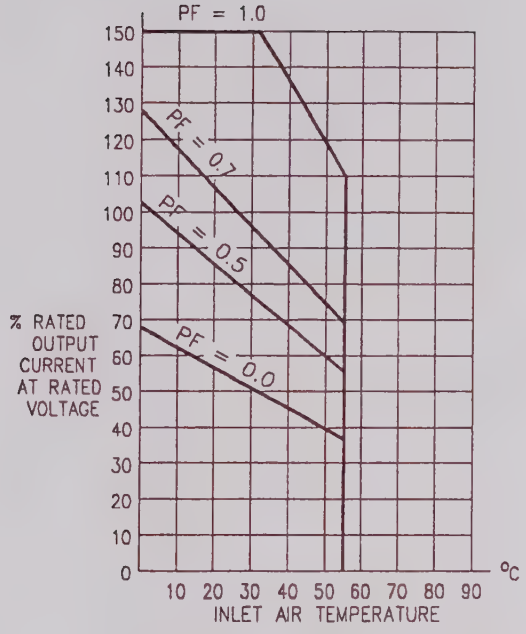


THERMAL DERATING CHART

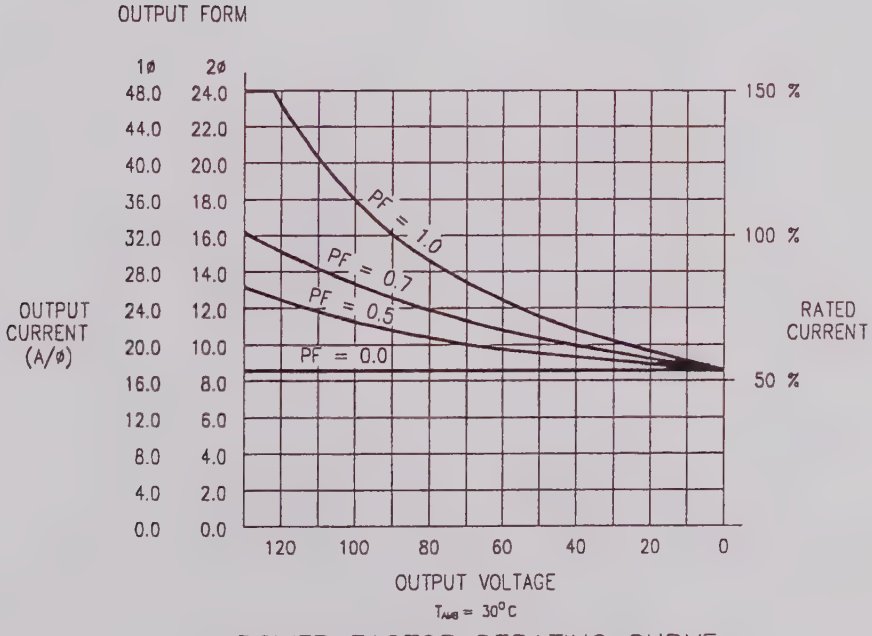


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(D) MODEL 125-AMX OUTPUT DERATING CURVES

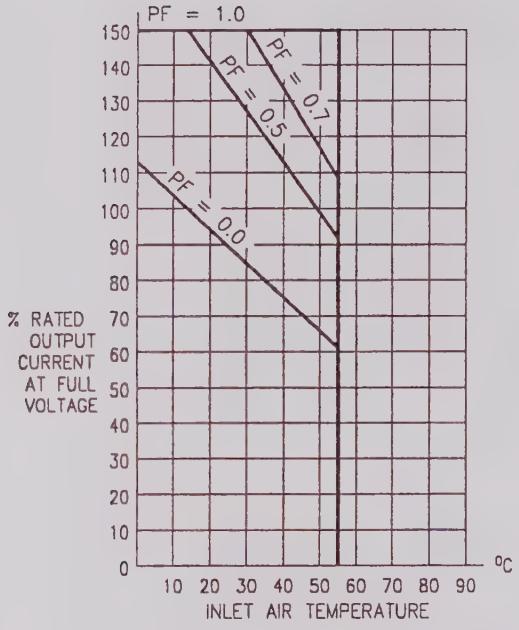


THERMAL DERATING CHART

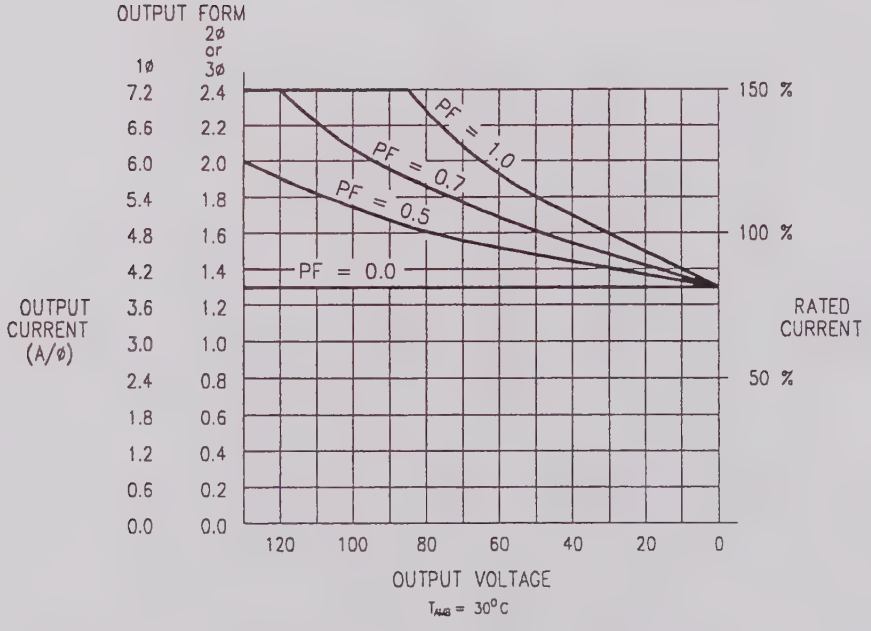


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(E) MODEL 140-AMX OUTPUT DERATING CURVES

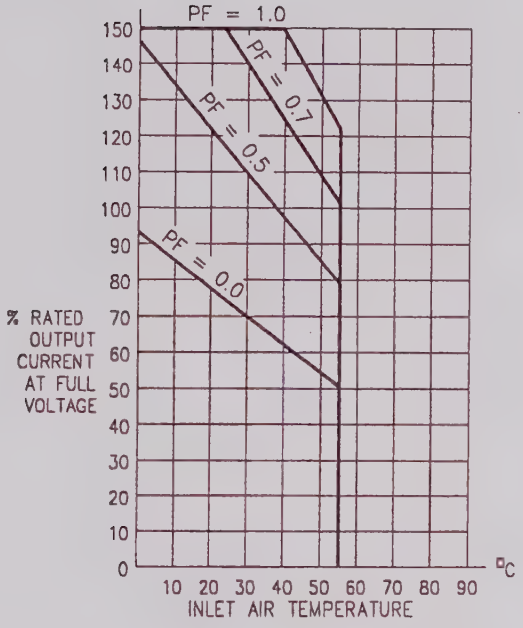


THERMAL DERATING CHART

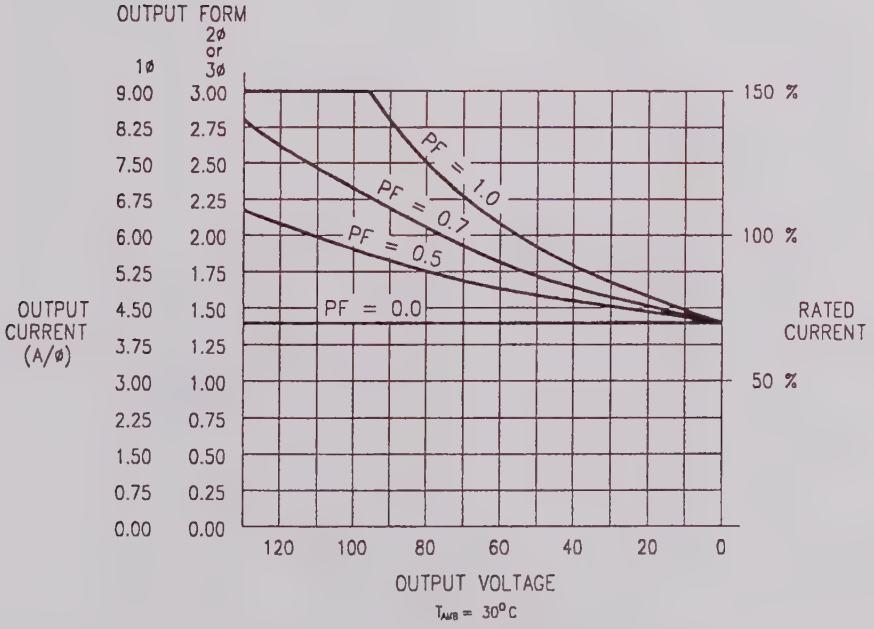


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(F) MODEL 305-AMX OUTPUT DERATING CURVES

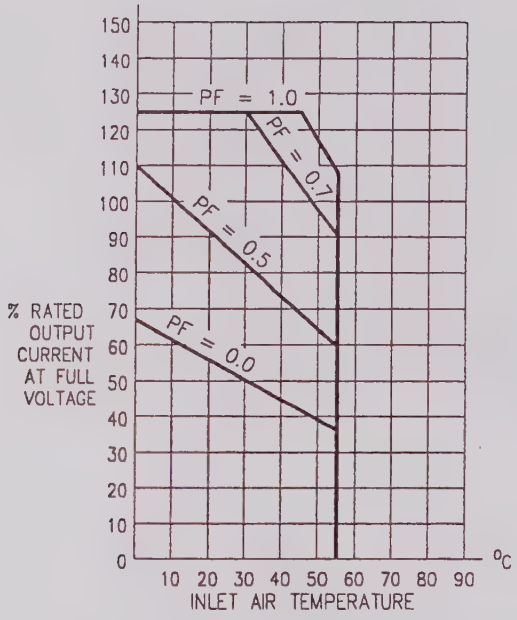


THERMAL DERATING CHART

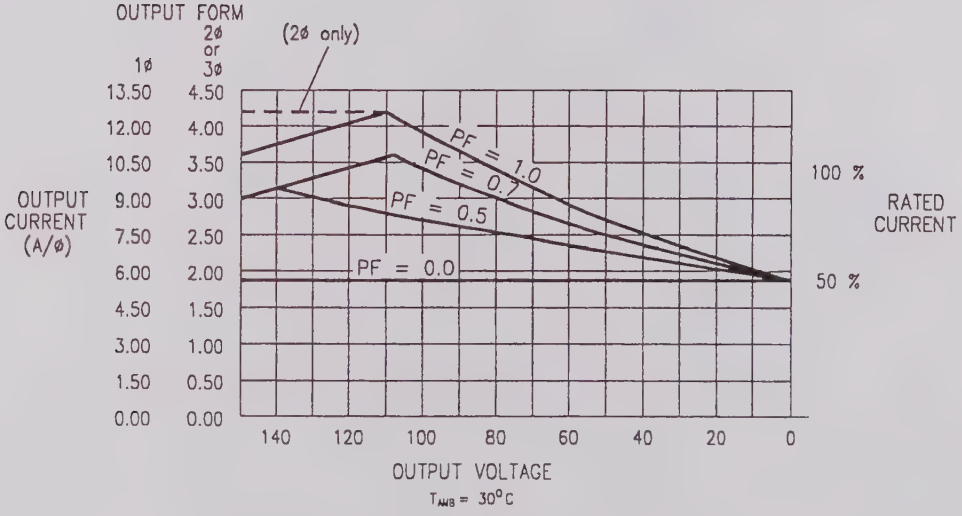


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(G) MODEL 308-AMX OUTPUT DERATING CURVES

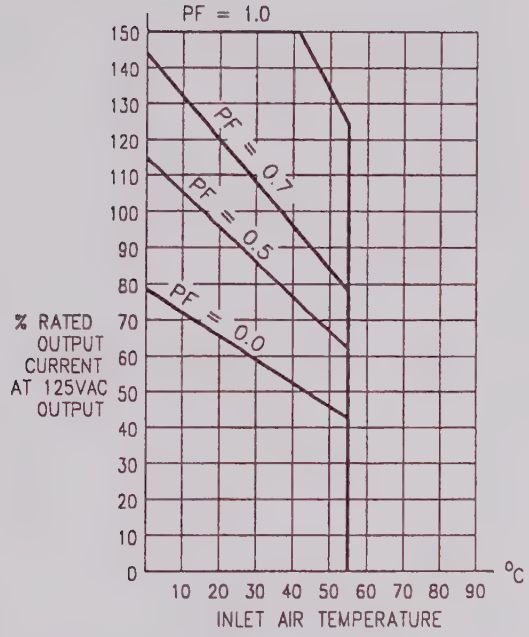


THERMAL DERATING CHART

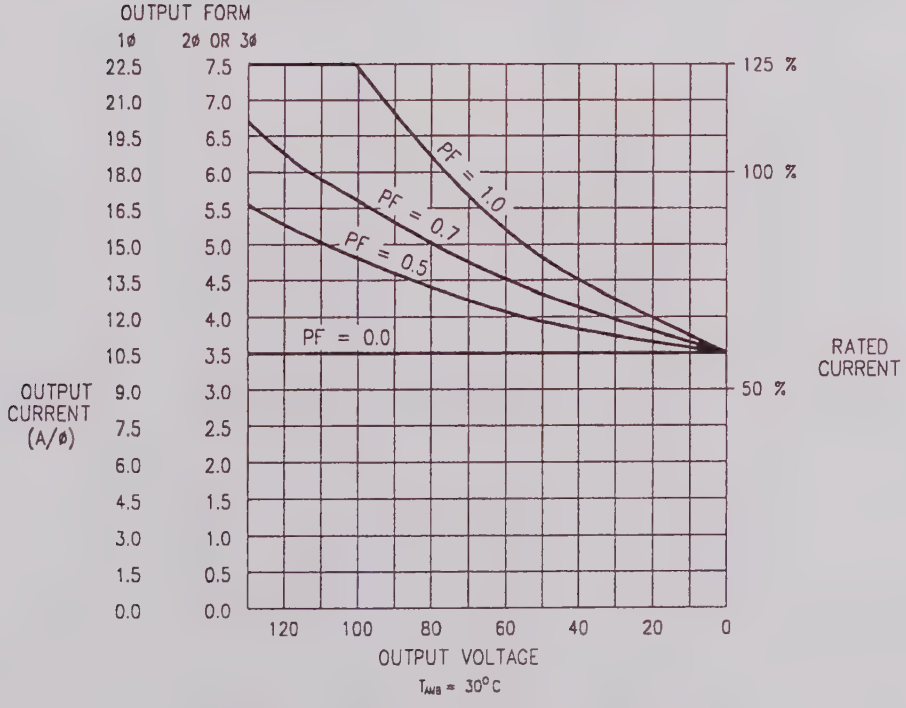


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(H) MODEL 312-AMX OUTPUT DERATING CURVES

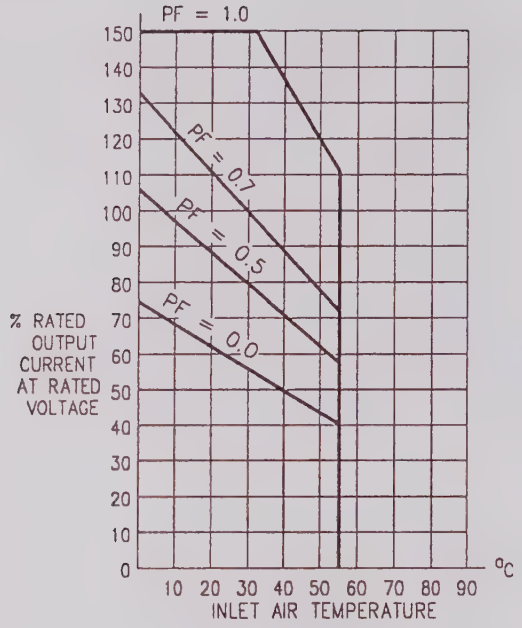


THERMAL DERATING CHART

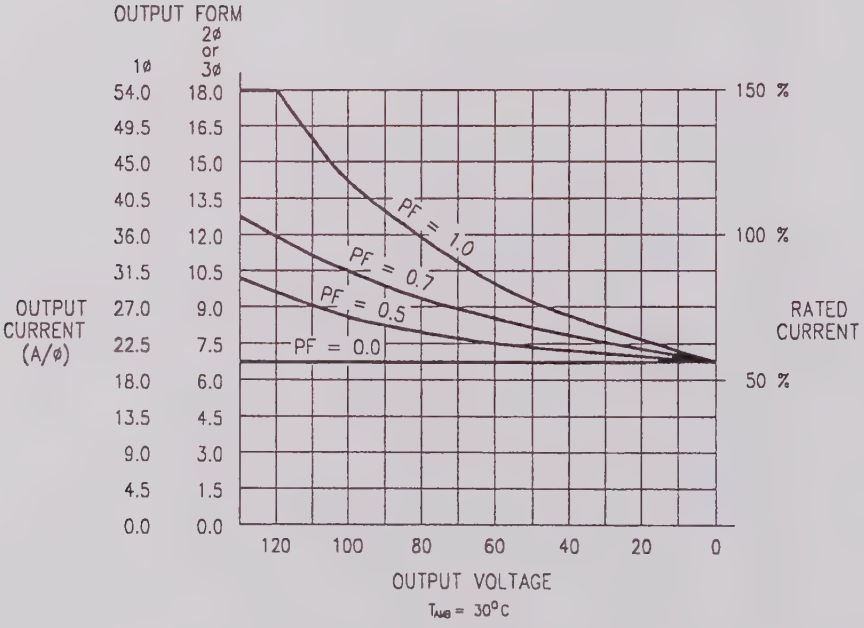


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(J) MODEL 320-AMX OUTPUT DERATING CURVES

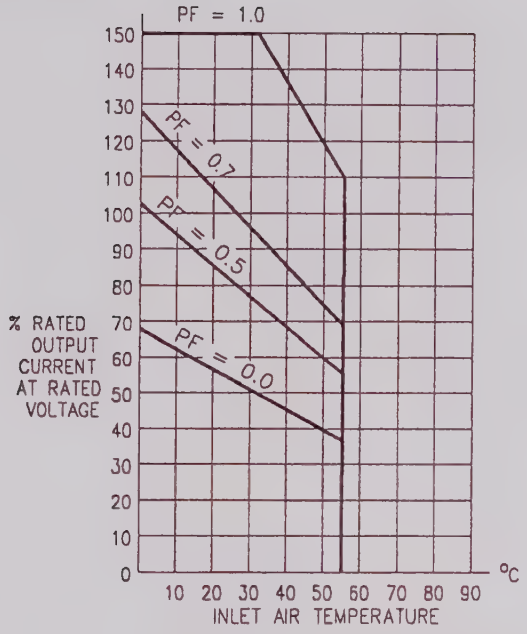


THERMAL DERATING CHART

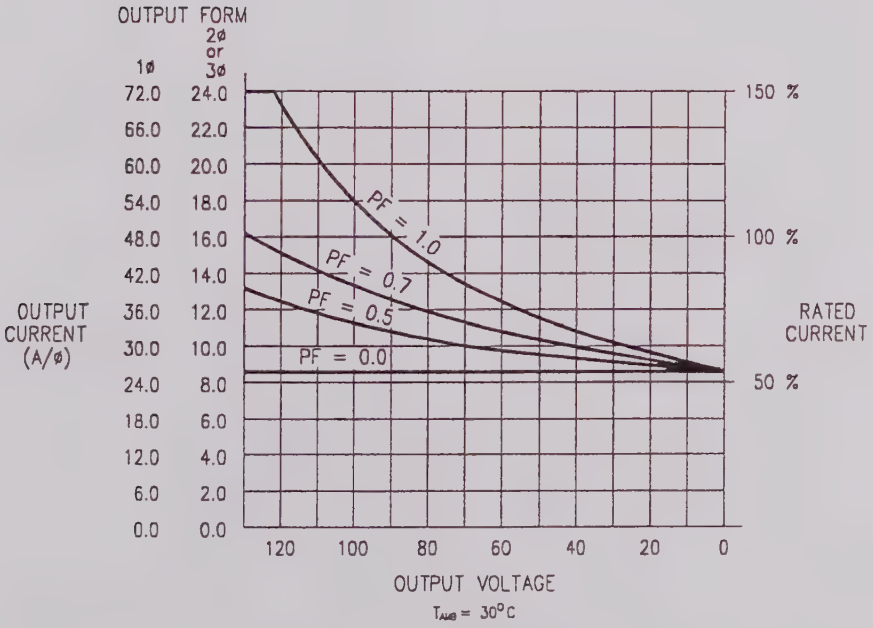


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(K) MODEL 345-AMX OUTPUT DERATING CURVES

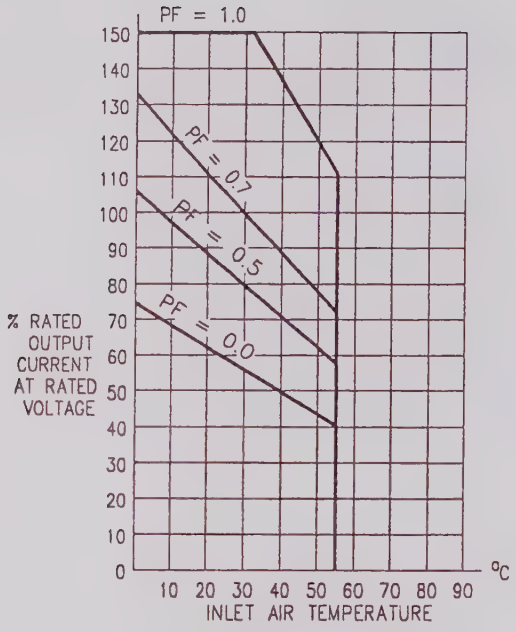


THERMAL DERATING CHART

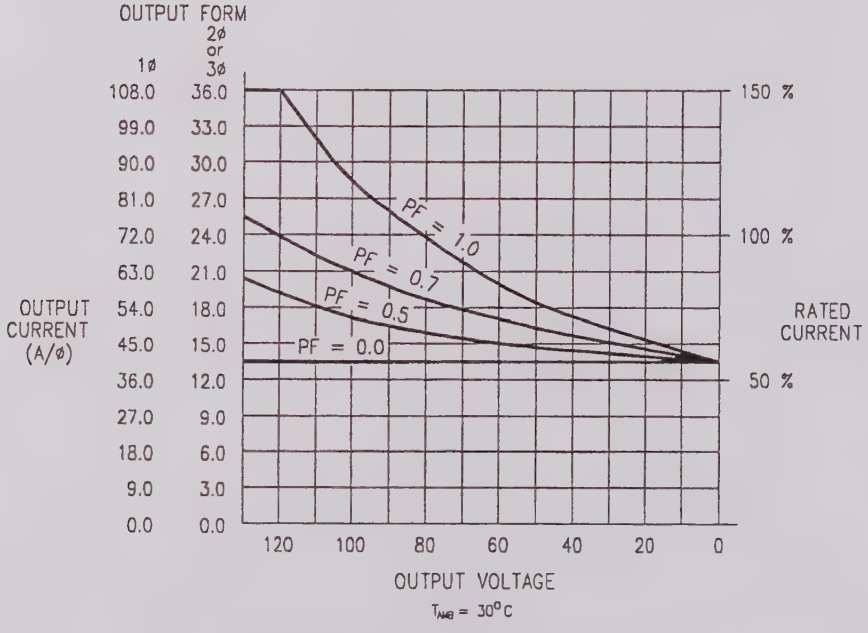


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(L) MODEL 360-AMX OUTPUT DERATING CURVES

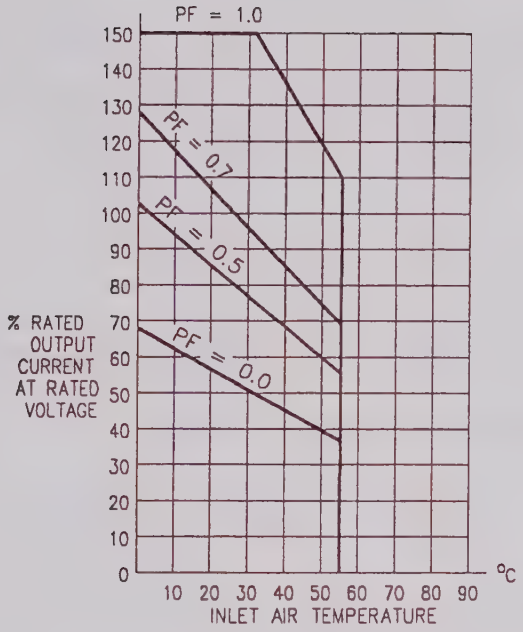


THERMAL DERATING CHART

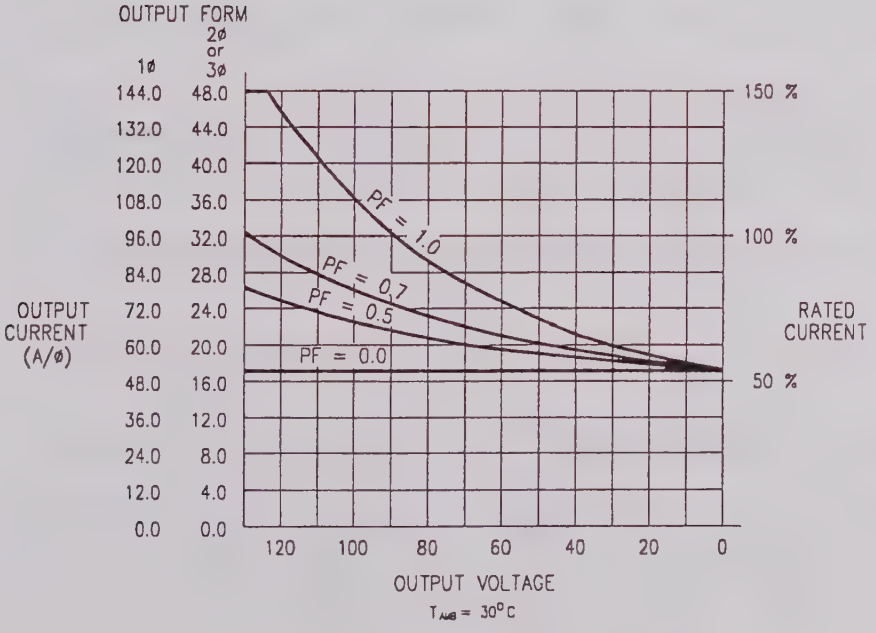


POWER FACTOR DERATING CURVE

FIGURE 2.1.2(M) MODEL 390-AMX OUTPUT DERATING CURVES



THERMAL DERATING CHART



POWER FACTOR DERATING CURVE

FIGURE 2.1.2(N) MODEL 3120-AMX OUTPUT DERATING CURVES

2.1.3 OUTPUT POWER FACTOR

The AMX-Series Power Source is designed to operate into any load power factor. However, for load power factors less than ±0.7, the system is derated as shown by the Power Factor Derating chart of Figures 2.1.2(A-N).

2.1.4 OUTPUT FREQUENCY

The output frequency range of the AMX-Series Power Source is determined by the controller which is installed in the system. Refer to the appropriate controller manual for output frequency specifications.

2.1.5 OUTPUT DISTORTION

The output distortion of the AMX-Series Power Source is typically less than 0.10% THD for output frequencies in the range of 45 to 1,000 Hz. Output Distortion is less than 0.25% for frequencies in the range of 20 to 5,000 Hz.

2.1.6 OUTPUT LOAD REGULATION

DIRECT-COUPLED
Load regulation of the AMX-Series Power Source is less than 0.25% when the system is operated in the direct-coupled mode.

TRANSFORMER-COUPLED
Load regulation of the AMX-Series Power Source varies with Turns Ratio when the system is operated in the transformer-coupled mode. Use of Continuous-Self-Calibration (CSC) or current compensation improves load regulation to less than 0.10%. Uncompensated load regulation is listed below.

TURNS RATIO	LOAD REGULATION (Uncompensated)
1.5:1	2%
2.0:1	4%
2.5:1	5%

2.1.7 INPUT LINE REGULATION

Input line regulation of the AMX-Series Power Source is less than 0.1% for a 10% change in line voltage (provided, input line voltage remains within the specified range of ±10% of nominal rating).

2.1.8 OUTPUT BANDWIDTH

The output bandwidth of the AMX-Series Power Source is listed below.

Full Power: 45 to 500 Hz (±0.10 db [± 1%])
20 to 5,000 Hz (±0.25 db [± 3%])

Small Signal: 5 to 40,000 Hz (±3 db [±30%])
(rated at 10% of full-scale output voltage)

2.1.9 LOAD TRANSIENT RESPONSE

Output load transient response for a 0-100% load induced step transient is approximately 5 μsec.

2.1.10 OUTPUT DC OFFSET

The DC offset present on the output of the AMX-Series Power Source is less than 10 mVDC for the Models 105, 108, 112, 305, 308, 312, and 320-AMX; and less than 5 mVDC for the Models 125, 140, 345, 360, 390, and 3120-AMX.

2.1.11 OUTPUT PROTECTION

The output of the AMX-Series Power Source is protected through the use of electronic current limiting. The output will automatically recover when the output fault is removed. Thermal overload protection is also provided. Refer to paragraph 2.3.3 for details.

Note:

The programmable controller also provides programmable current limit. Refer to the *UPC-Series Operation Manual* for details.

2.1.12 OUTPUT CONTROL CHARACTERISTICS

Output control characteristics, sync I/O signals and metering capabilities are determined by the controller which is installed. Refer to the appropriate controller manual for details.

2.1.13 OUTPUT ISOLATION

The output of the AMX-Series is galvanically isolated from the chassis and input power. Output Neutral to Chassis voltage is allowed to be 150 VAC, maximum. (Refer to Paragraph 3.4.4 for special considerations when using transformer-coupled outputs.)

2.2 MECHANICAL SPECIFICATIONS

This paragraph describes the mechanical characteristics of the AMX-Series Power Sources.

2.2.1 DIMENSIONS

Dimensions of the AMX-Series Power Sources are listed below.

MODEL 105-AMX

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.00" [584 mm] (measured from back side of front panel, excludes terminal blocks)
Weight:	60 lbs. [27 kg] (w/o output transformers); 70 lbs. [32 kg] (with output transformers)

Refer to Figure 2.2.1 for the outline drawing of the Model 105-AMX.

MODEL 108-AMX

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.00" [584 mm] (measured from back side of front panel, excludes terminal blocks)
Weight:	60 lbs. [27 kg] (w/o output transformers); 70 lbs. [32 kg] (with output transformers)

Refer to Figure 2.2.1 for the outline drawing of the Model 108-AMX.

MODEL 112-AMX

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.00" [584 mm] (measured from back side of front panel, excludes terminal blocks)
Weight:	70 lbs. [32 kg]

Refer to Figure 2.2.1 for the outline drawing of the Model 112-AMX.

MODEL 125-AMX

Height:	10.50" [267 mm]
Width:	19.00" [483 mm] (front panel); 17.00" [432 mm] (chassis)
Depth:	23.50" [597 mm]
Weight:	110 lbs. [50 kg]

Refer to Figure 2.2.3 for the outline drawing of the Model 125-AMX.

2.2.1 DIMENSIONS (cont.)

MODEL 140-AMX

Power Source:

Height:	14.00" [356 mm]
Width:	19.00" [483 mm] (front panel); 17.00" [432 mm] (chassis)
Depth:	23.50" [597 mm]
Weight:	170 lbs. [77 kg]

Refer to Figure 2.2.3 for the outline drawing of the Model 140-AMX.

MODEL 305-AMX

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.00" [584 mm] (measured from back side of front panel, excludes terminal blocks)
Weight:	60 lbs. [27 kg] (w/o output transformers); 75 lbs. [34 kg] (with output transformers)

Refer to Figure 2.2.1 for the outline drawing of the Model 305-AMX.

MODEL 308-AMX

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.00" [584 mm] (measured from back side of front panel, excludes terminal blocks)
Weight:	60 lbs. [27 kg] (w/o output transformers); 75 lbs. [34 kg] (with output transformers)

Refer to Figure 2.2.1 for the outline drawing of the Model 308-AMX.

MODEL 312-AMX

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.00" [584 mm] (measured from back side of front panel, excludes terminal blocks)
Weight:	70 lbs. [32 kg]

Refer to Figure 2.2.1 for the outline drawing of the Model 312-AMX.

2.2.1 DIMENSIONS (cont.)

MODEL 320-AMX

Height:	8.75" [222 mm]	
Width:	19.00" [483 mm]	(front panel); 16.75" [426 mm] (chassis)
Depth:	23.12" [587 mm]	(measured from back side of front panel, excludes terminal blocks)
Weight:	125 lbs. [57 kg]	

Refer to Figure 2.2.2 for the outline drawing of the Model 320-AMX.

MODEL 345-AMX

Power Source:

Height:	14.00" [356 mm]	
Width:	19.00" [483 mm]	(front panel); 17.00" [432 mm] (chassis)
Depth:	23.50" [597 mm]	
Weight:	170 lbs. [77 kg]	

Refer to Figure 2.2.3 for the outline drawing of the Model 345-AMX.

MODEL 360-AMX

Power Source:

Height:	14.00" [356 mm]	
Width:	19.00" [483 mm]	(front panel); 17.00" [432 mm] (chassis)
Depth:	23.50" [597 mm]	
Weight:	180 lbs. [82 kg]	

Refer to Figure 2.2.3 for the outline drawing of the Model 360-AMX.

MODEL 390-AMX

Power Source:

Height:	28.00" [712 mm]	(14.00" [356 mm] x 2ea)
Width:	19.00" [483 mm]	(front panel); 17.00" [432 mm] (chassis)
Depth:	23.50" [597 mm]	
Weight:	340 lbs [154 kg]	(170 lbs. [77 kg] x 2ea)

Refer to Figure 2.2.4 for the outline drawing of the Model 390-AMX.

2.2.1 DIMENSIONS (cont.)

MODEL 3120-AMX

Power Source:

Height:	28.00" [712 mm] (14.00" [356 mm] x 2ea)
Width:	19.00" [483 mm] (front panel); 17.00" [432 mm] (chassis)
Depth:	23.50" [597 mm]
Weight:	360 lbs [163 kg] (180 lbs. [82 kg] x 2ea)

Refer to Figure 2.2.4 for the outline drawing of the Model 3120-AMX.

MAGNETICS MODULE

Magnetics Module:

(Houses Output Transformers used with 345-AMX through 3120-AMX power sources. Two ea. required for 390-AMX and 3120-AMX systems.)

Height:	5.25" [134 mm]
Width:	19.00" [483 mm] (front panel); 16.75" [426 mm] (chassis)
Depth:	23.50" [597 mm]
Weight:	120 lbs. [55 kg]

Refer to Figure 2.2.4 for the outline drawing of the Magnetics Module.

2.2.2 INPUT POWER CONNECTION

The input power is brought into the AMX-Series Power Source via the rear panel. An unterminated power cord is provided on the Models 105-AMX, 108-AMX, 112-AMX, 305-AMX, 308-AMX, 312-AMX, and 320-AMX. A terminal block is provided on the Models 125-AMX, 140-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX.

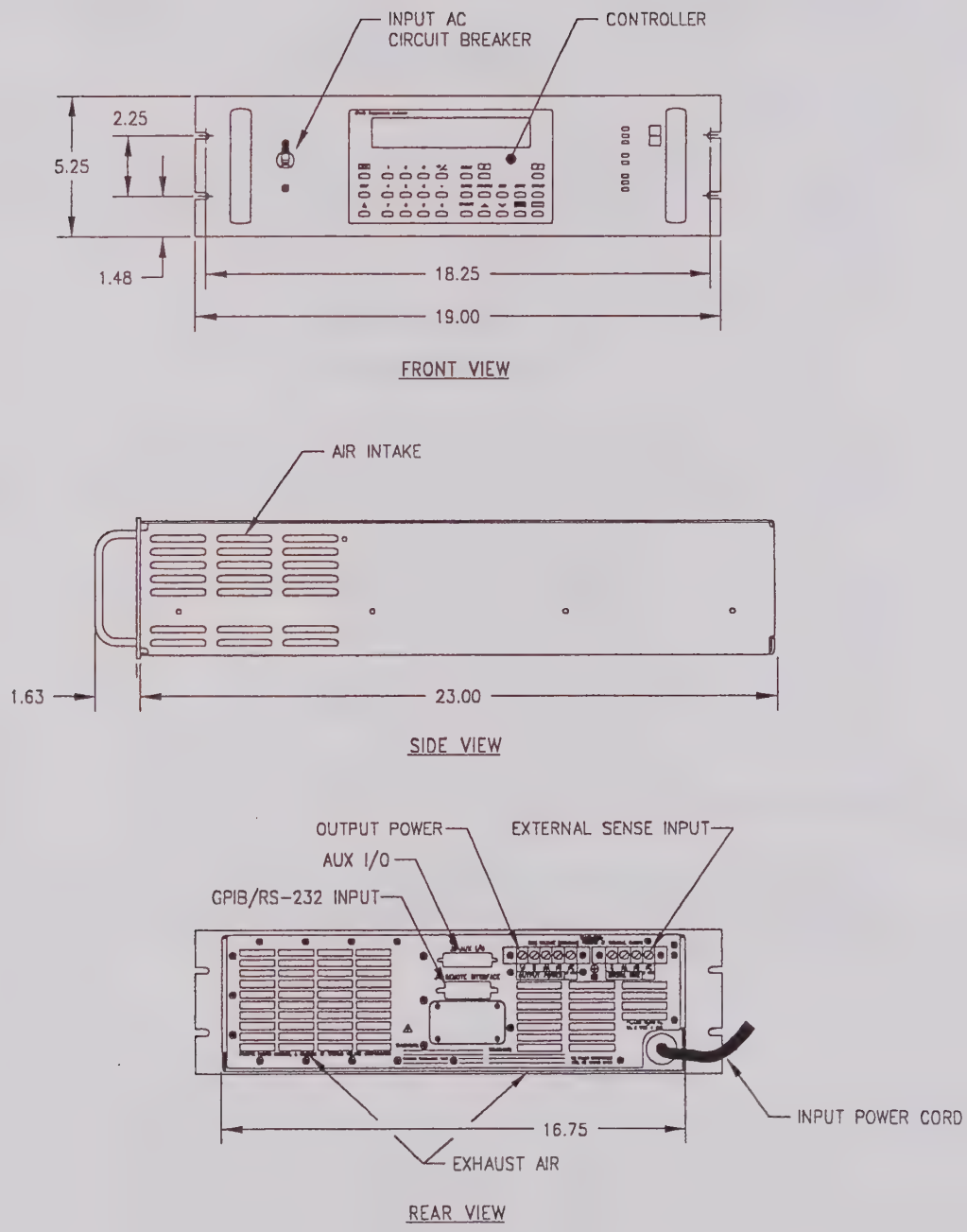
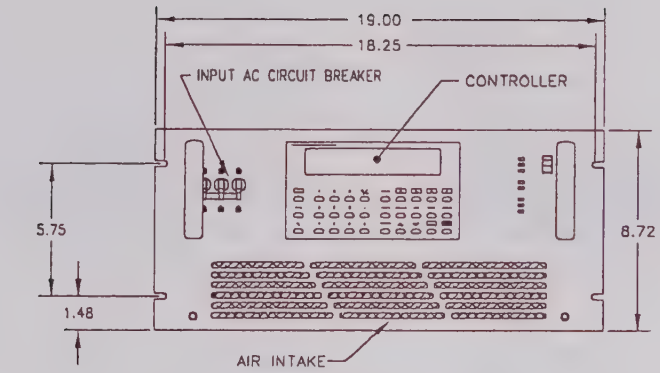
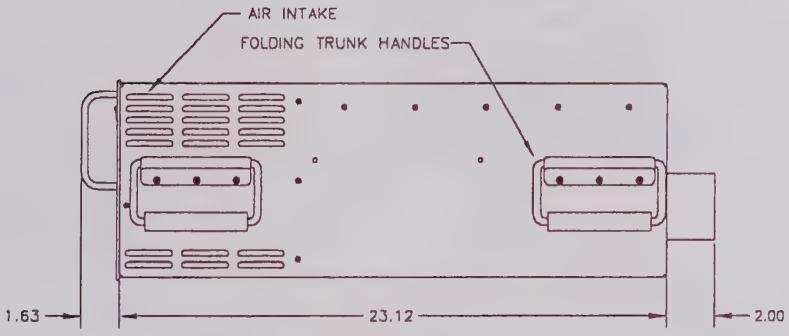


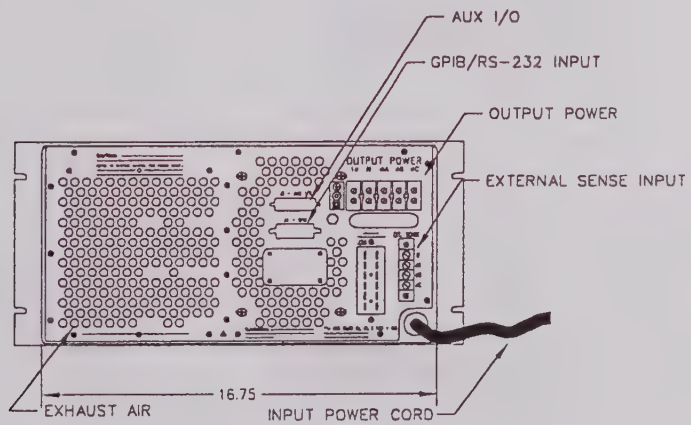
FIGURE 2.2.1 OUTLINE DRAWING, MODELS 105, 108, 112, 305, 308, AND 312-AMX



FRONT VIEW



SIDE VIEW



REAR VIEW

FIGURE 2.2.2 OUTLINE DRAWING, MODEL 320-AMX

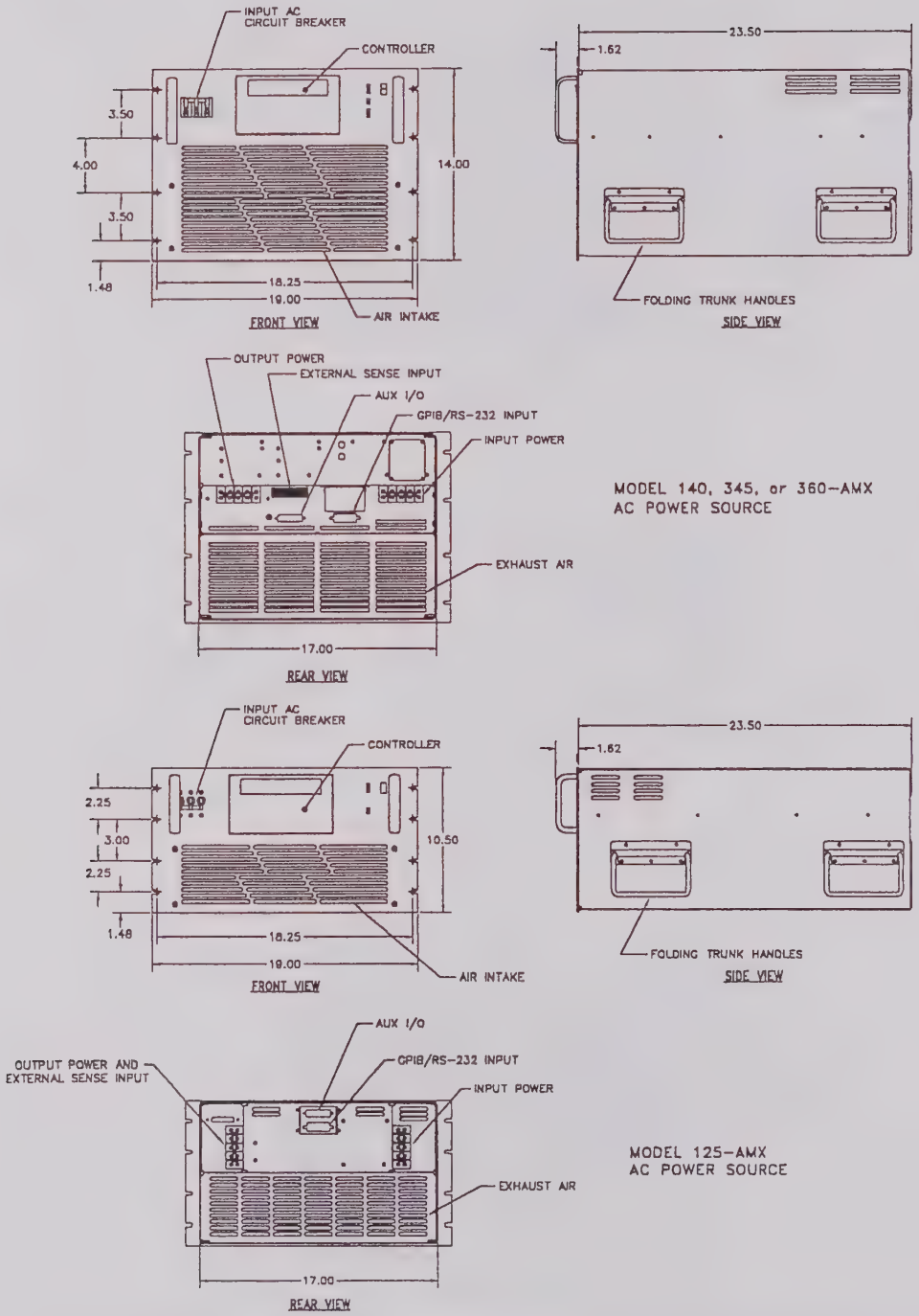


FIGURE 2.2.3 OUTLINE DRAWING, MODELS 125, 140, 345, AND 360-AMX

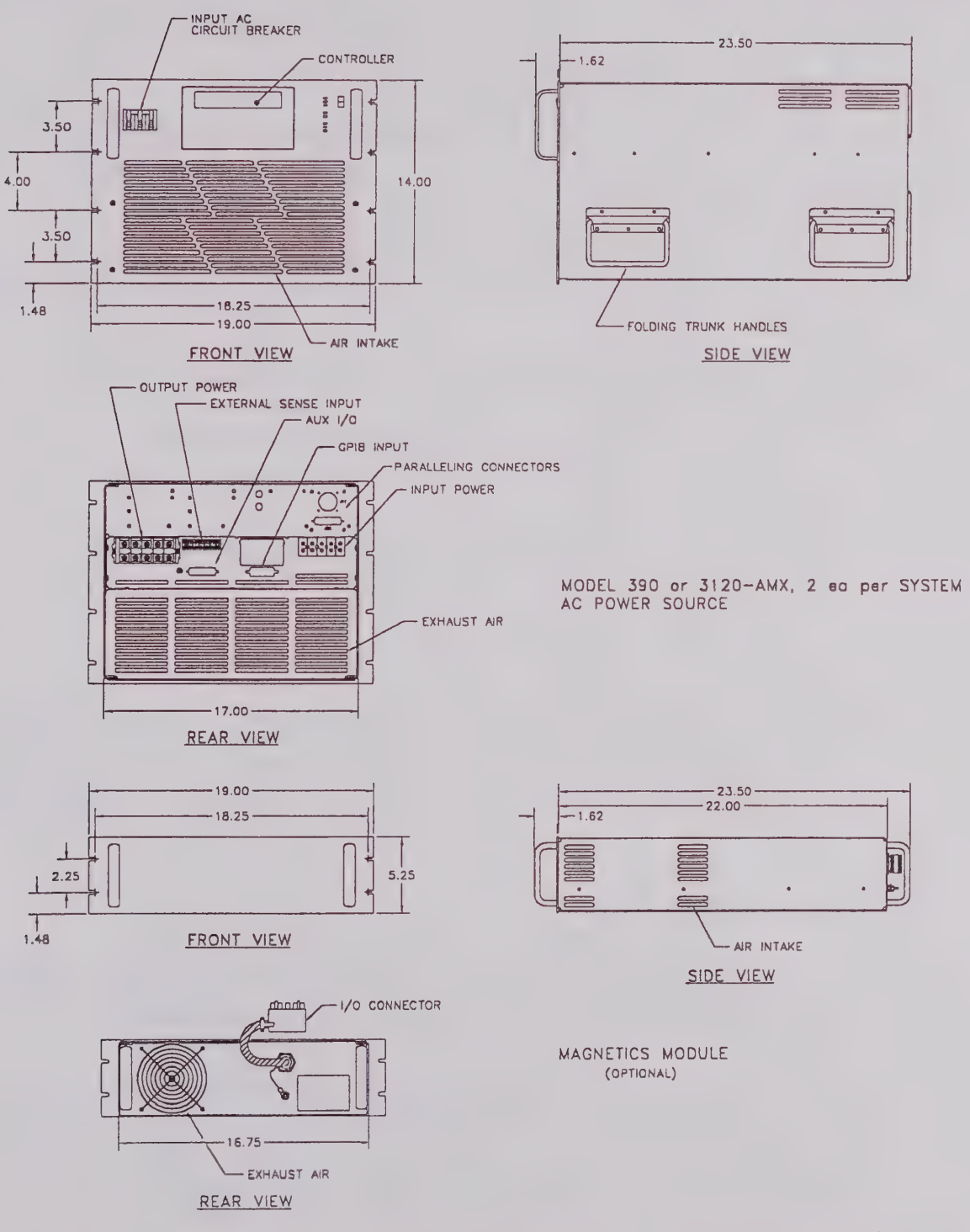


FIGURE 2.2.4 OUTLINE DRAWING, MODELS 390-AMX, 3120-AMX, AND MAGNETICS MODULE

2.2.3 OUTPUT POWER CONNECTION

Output power is taken from the AMX-Series Power Source via rear panel mounted terminal blocks.

2.2.4 CHASSIS SLIDE MOUNTS

The chassis of the AMX-Series Power Source is designed to accept slide rails. These are provided as a cost option. For more information, contact your local sales representative or the Pacific Power Source Sales Office.

2.3 ENVIRONMENTAL SPECIFICATIONS

This paragraph lists the environmental requirements of the AMX-Series Power Source.

2.3.1 TEMPERATURE RANGE

The AMX-Series Power Source is rated for full operation in ambient temperatures of 0 - 55°C and where the relative humidity is in the range of 0 - 95%, non-condensing.

2.3.2 COOLING

The AMX-Series Power Source utilizes thermally regulated forced-air cooling to maintain proper temperatures throughout. The maximum airflow of the Models 105-AMX, 108-AMX, 305-AMX, and 308-AMX is 100 CFM. The maximum airflow of the Models 112-AMX and 312-AMX is 200 CFM. The maximum airflow of the Models 125-AMX and 320-AMX is 300 CFM. The maximum airflow of the Models 140-AMX, 345-AMX, and 360-AMX is 600 CFM. The maximum airflow of the Models 390-AMX and 3120-AMX is 1200 CFM.

2.3.3 THERMAL PROTECTION

The input power transformer is configured with a thermocouple which senses its temperature. Additionally, the power amplifier PCB assemblies are also configured with temperature sensors. When the transformer or any power amplifier PCB exceeds maximum safe operating temperature, the output relays are opened and the Shutdown Lamp, located on the front panel, is lighted.

The shutdown fault is implemented such that it must be manually reset. The fault can be reset after the over-temperature condition has ceased to exist and the Output Power Switch is placed in the "**OFF**" position. Sending an Output Off command via the remote interface (applies to programmable systems only) also resets the shutdown fault, provided that the condition which originally caused the shutdown has been cleared. If the Output On/Off command is sent via the remote interface and the shutdown condition has not been cleared, the power source will remain in the shutdown state until the offending condition has cleared.

SECTION 3

INSTALLATION

3.0 INSTALLATION

This section describes the installation of the AMX-Series AC Power Source.

3.1 CHASSIS PLACEMENT

The AMX-Series Power Source is designed to fit into the standard 19 inch rack. Provisions for mounting slide rails are included in the chassis. The chassis can also be used as a bench-top unit, if desired.

*** * * WARNING * * ***

- THE AMX-SERIES CHASSIS IS HEAVY !
  (VARIOUS MODELS WEIGH APPROX 50-180 lbs PER ASSY)
  USE EXTREME CARE WHEN MOVING THE UNIT.

- THE MAGNETICS MODULE, MODELS 125-AMX, 140-AMX, AND 320-AMX THROUGH 3120-AMX ARE NOT A ONE-PERSON LIFT. UNIT MUST BE LIFTED BY TWO OR MORE INDIVIDUALS IN ORDER TO REDUCE CHANCE OF PHYSICAL INJURY.

*** * * WARNING * * ***

--------PACKING NOTICE------

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT UNITS ARE ADEQUATELY PACKAGED WHEN THEY ARE MOVED TO A DIFFERENT LOCATION. THE UNITS SHOULD ALWAYS BE PACKAGED IN THE ORIGINAL SHIPPING CONTAINER WHEN MOVED OR RETURNED TO THE FACTORY FOR SERVICE. INADEQUATE PACKAGING WILL RESULT IN CHASSIS DAMAGE--INCURRING NON-WARRANTY SERVICE COSTS.

--------PACKING NOTICE------

3.1 CHASSIS PLACEMENT (cont.)

The first step in setting the chassis into place is to remove it from its shipping container. The next step is to select an appropriate location for the unit. Key points to consider when locating the chassis are:

1. **PROXIMITY TO THE LOAD** - The power source should be located as close to the load as possible. This helps to reduce distribution losses. These losses become more critical as the output frequency increases.

2. **VENTILATION** - The chassis requires good ventilation to adequately cool the internal components. Airflow ranges from 200 to 1200 CFM. A minimum of 12 inches front and back clearance is recommended for proper operation of the Models 125-AMX, 140-AMX, 320-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX. The air intake for the Models 105-AMX, 108-AMX, 112-AMX, 305-AMX, 308-AMX, 312-AMX, and 320-AMX is located on both sides near the front. A minimum clearance of two inches on each side and 12 inches to the rear is required for proper operation of these models.

When the chassis is placed in a 19 inch rack, it must be supported by either chassis slides or full depth angle brackets. The front panel alone will not support the weight of the chassis. Chassis slides are available from Pacific Power Source as a cost option. Call factory service for details.

After the location for the chassis is selected, verify that the input voltage of the power source is correct (Input voltage is stated on the system ID label). If it requires changing, refer to Paragraph 3.3 for instructions.

Also check that the output voltage range is that which is desired. If not, reconfigure to the desired form as directed by Paragraph 3.2.

After the input voltage form and output voltage range have been verified as correct, slide the chassis into the rack or set it into its final position. Make input and output connections as stated in paragraphs 3.3 and 3.4, respectively.

If either the Remote Interface (GPIB or RS-232) or External Sense feature is to be used, refer to paragraphs 3.5 and 3.7 for connection.

3.2 OUTPUT VOLTAGE RANGE CONFIGURATION

This paragraph describes the configuration of the Output Voltage Range for the AMX-Series Power Source.

The AMX-Series Power Source can be configured for several different Output Voltage Ranges. The standard output configurations are:

1)	-	0-110 VAC_{l-n}	Direct-Coupled Output on 112-AMX and 312-AMX
		0-125 VAC_{l-n}	Direct-Coupled Output on 112-AMX and 312-AMX
		0-135 VAC_{l-n}	Direct-coupled Output, standard on most models
		0-150 VAC_{l-n}	Direct-Coupled Output on 112-AMX, 125-AMX, and 312-AMX
2)	VR1.5	0-204 VAC_{l-n}	Models 105-AMX, 108-AMX, 140-AMX, 305-AMX, 308-AMX, 320-AMX, 345-AMX, 360-AMX, 390-AMX, & 3120-AMX equipped with Magnetics Option
3)	VR2.0	0-273 VAC_{l-n}	(Same as VR1.5 above)
4)	VR2.5	0-341 VAC_{l-n}	(Same as VR1.5 above)

The 0-110 through 0-150VAC output ranges are direct-coupled outputs and are always available. The remaining output forms are transformer-coupled. Only one is available when output transformers are installed. However, systems can be reconfigured for a different range, if required.
Configuration of the output voltage range is set at the time of order. Systems are configured at the factory as ordered. The System ID label or Magnetics Module ID label will state the factory configured Voltage Range if transformer-coupled outputs are present. If the output voltage range specified on the System ID label or Magnetics Module ID label is that which is desired, no further action is required. Otherwise, reconfiguration is required.

Also described in the following paragraphs are model specific controller details (Transformer Ratio and Amps to Volts Ratio settings) that, although factory preset, must be set as described if inadvertantly changed or otherwise modified.

Configuration of the Output voltage consists of

1) Verifying that the appropriate output transformer taps have been selected.
2) Verifying the proper setting of the Transformer Ratio Switch within the UPC.
3) Verifying the proper setting of the Amps to Volts Ratio Switch within the UPC
4) Calibration of the system.

Configuration varies from model to model. The following paragraphs describe the configuration settings of the available standard output ranges. Refer to the appropriate paragraph for details. When custom output transformers have been installed, refer to Section 9, Modifications. The instructions stated in Section 9 take precedence over those listed in the following paragraphs.

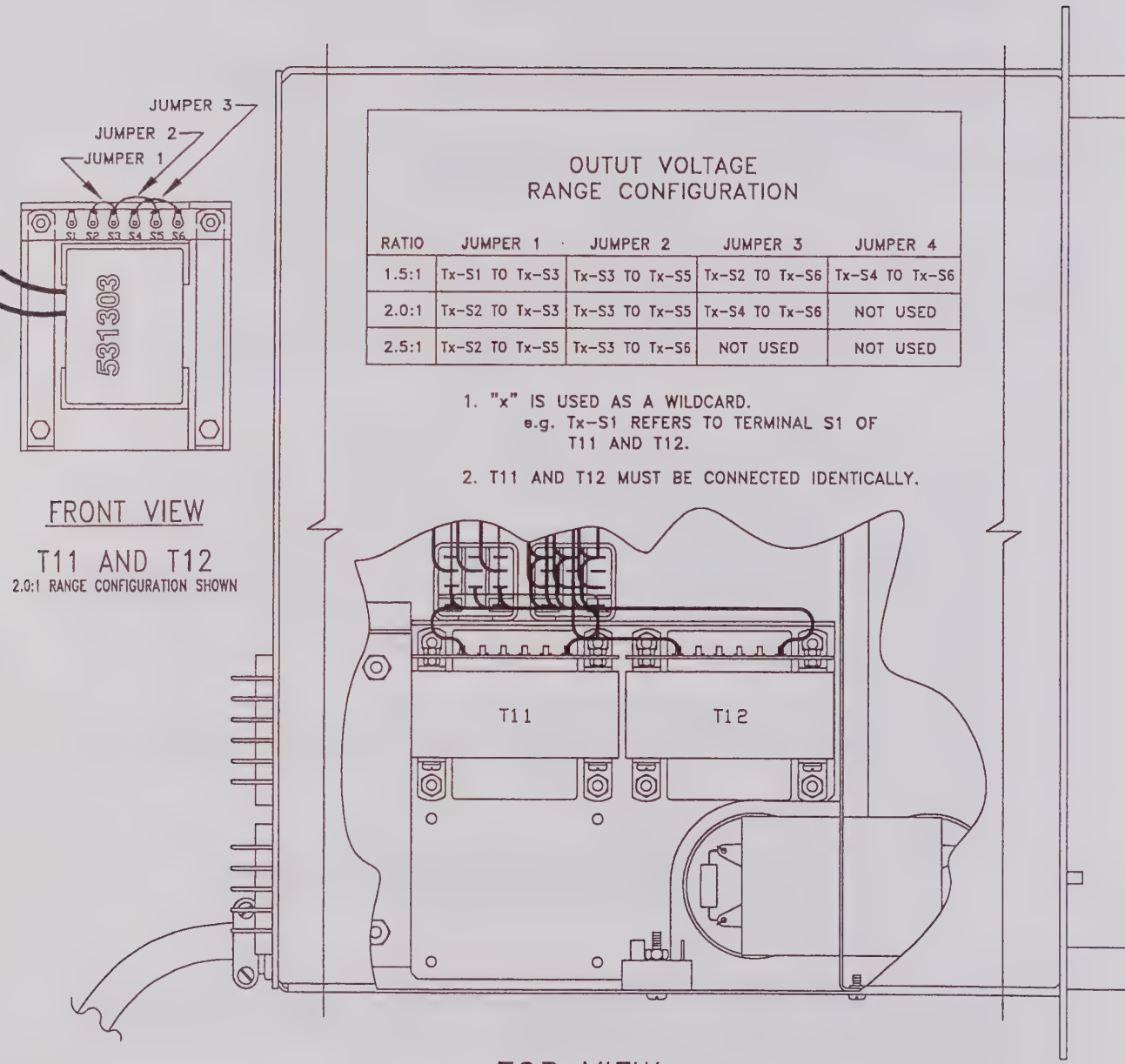

JUMPER 3
JUMPER 2
JUMPER 1
S1 S2 S3 S4 S5 S6
531303
FRONT VIEW
T11 AND T12
2.0:1 RANGE CONFIGURATION SHOWN
OUTUT VOLTAGE
RANGE CONFIGURATION
RATIO | JUMPER 1 | JUMPER 2 | JUMPER 3 | JUMPER 4
1.5:1 | Tx-S1 TO Tx-S3 | Tx-S3 TO Tx-S5 | Tx-S2 TO Tx-S6 | Tx-S4 TO Tx-S6
2.0:1 | Tx-S2 TO Tx-S3 | Tx-S3 TO Tx-S5 | Tx-S4 TO Tx-S6 | NOT USED
2.5:1 | Tx-S2 TO Tx-S5 | Tx-S3 TO Tx-S6 | NOT USED | NOT USED
1. "x" IS USED AS A WILDCARD.
e.g. Tx-S1 REFERS TO TERMINAL S1 OF T11 AND T12.
2. T11 AND T12 MUST BE CONNECTED IDENTICALLY.
T11
T12
TOP VIEW
SOME DETAIL OMITTED FOR CLARITY.

FIGURE 3.2.1 105-AMX AND 108-AMX OUTPUT VOLTAGE CONFIGURATION

3.2.1 OUTPUT VOLTAGE RANGE CONFIGURATION, MODELS 105-AMX & 108-AMX

This paragraph describes the configuration of the Output Voltage Range for the Models 105 and 108-AMX Power Sources. These models can be configured for either 0-135 $VAC_{l\text{-}n}$, 0-204 $VAC_{l\text{-}n}$, 0-273 $VAC_{l\text{-}n}$, or 0-341 $VAC_{l\text{-}n}$. The 0-204 VAC range is designated as the VR1.5 output form, the 0-273 VAC range is defined to be the VR2.0 output form, and the 0-341 VAC range is defined as the VR2.5 output form. An Output Transformer Assembly is required for the 204, 273, and 341 VAC output forms. Installation of the VR1.5, VR2.0, or VR2.5 output forms is performed by the factory and can be installed on existing units not so equipped.

Refer to Figure 3.2.1 for voltage range tap selection information.

When the system is supplied with the VR1.5 output form, set the Transformer Ratio Switch of the UPC to 1.5. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.) The Transformer Ratio switch is set to 2.0 for systems configured with the VR2.0 output form and 2.5 for systems configured for the VR2.5 output form. The Transformer Ratio switch is set to 0.0 on systems not equipped with output transformers.

The Amps to Volts Ratio Switch of the UPC is always set to 6 for the Models 105-AMX and 108-AMX. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

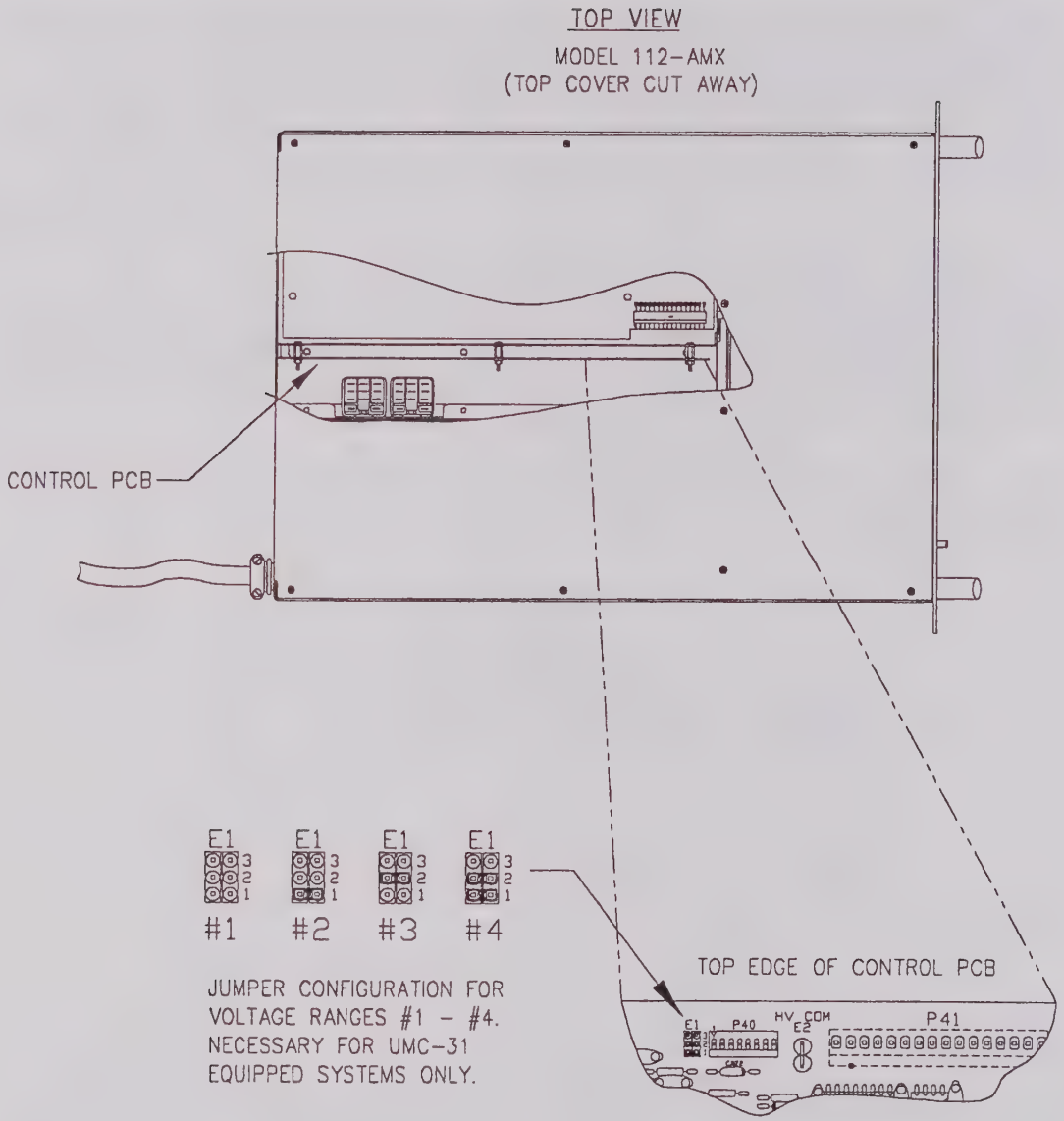


FIGURE 3.2.2(A) MODEL 112-AMX OUTPUT VOLTAGE RANGE CONFIGURATION JUMPER (E1) LOCATION

3.2.2 OUTPUT VOLTAGE RANGE CONFIGURATION, MODEL 112-AMX

This paragraph describes the configuration of the Output Voltage Range for the Model 112-AMX Power Source. This model can be configured for either 0-110 $VAC_{l\text{-}n}$, 0-125 $VAC_{l\text{-}n}$, 0-135 $VAC_{l\text{-}n}$, or 0-150 $VAC_{l\text{-}n}$. All ranges are direct-coupled outputs and are provided to maximize output current for a given output voltage. Range control is automatic for systems equipped with the UPC-12 controller. For systems equipped with the UMC-31 controller, configuration of the output form is performed by the factory per the original user requirements (0-150 $VAC_{l\text{-}n}$ is the factory default setting) but may be changed as needed. Refer to figures 3.2.2(A) and (B) for instructions.

The Transformer Ratio Switch of the UPC is always set to 0.0 in this model. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

The Amps to Volts Ratio Switch of the UPC is always set to 6 in the Model 112-AMX. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

FIGURE 3.2.2(B)
MODEL 112-AMX
OUTPUT VOLTAGE RANGE CONFIGURATION

Model 112-AMX equipped with an UMC-31 controller must have the Range Control jumpers (E1-1,2) on the Control PCB Assy set to the appropriate AC Output Voltage range. The following table outlines the ranges and the appropriate tap selection.

AC Output Voltage Range 112-AMX 1 ϕ / 2 ϕ	E1-1	E1-2	Range	Rated AC Output Current 112-AMX 1 ϕ / 2 ϕ	Reg. DC Voltage
0-110 $VAC_{l\text{-}n}$ / 0-220 $VAC_{l\text{-}l}$	Off	Off	#1	11.3 A/ 5.5 A	± 187 VDC
0-125 $VAC_{l\text{-}n}$ / 0-250 $VAC_{l\text{-}l}$	On	Off	#2	10 A/ 5.0 A	± 203 VDC
0-135 $VAC_{l\text{-}n}$ / 0-270 $VAC_{l\text{-}l}$	Off	On	#3	9 A/ 4.5 A	± 214 VDC
0-150 $VAC_{l\text{-}n}$ / 0-300 $VAC_{l\text{-}l}$	On	On	#4	8.3 A/ 4.1 A	± 226 VDC

Refer to figure 3.2.2(A) for Control PCB and E1 location.

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3.2.3 OUTPUT VOLTAGE RANGE CONFIGURATION, MODEL 125-AMX

This paragraph describes the configuration of the Output Voltage Range for the Model 125-AMX Power Source. This model is configured with a 0-150 $VAC_{l\text{-}n}$ range. This range is a direct-coupled output.

The Transformer Ratio Switch of the UPC is always set to 0.0 in this model. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

The Amps to Volts Ratio Switch of the UPC is always set to 9 in the Model 125-AMX. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

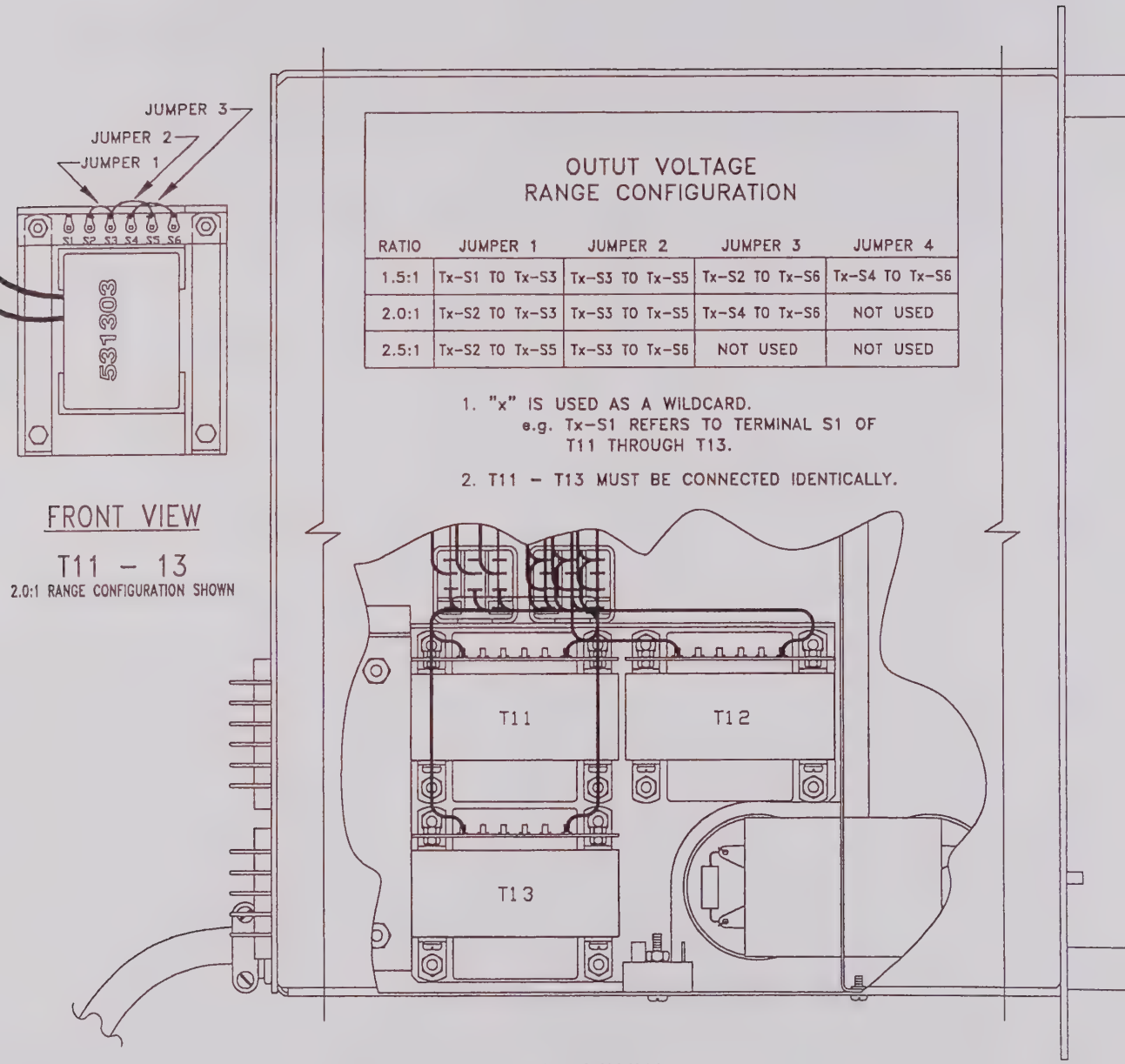
JUMPER 3
JUMPER 2
JUMPER 1
S1 S2 S3 S4 S5 S6
531303
FRONT VIEW
T11 - 13
2.0:1 RANGE CONFIGURATION SHOWN
OUTUT VOLTAGE
RANGE CONFIGURATION
RATIO | JUMPER 1 | JUMPER 2 | JUMPER 3 | JUMPER 4
1.5:1 | Tx-S1 TO Tx-S3 | Tx-S3 TO Tx-S5 | Tx-S2 TO Tx-S6 | Tx-S4 TO Tx-S6
2.0:1 | Tx-S2 TO Tx-S3 | Tx-S3 TO Tx-S5 | Tx-S4 TO Tx-S6 | NOT USED
2.5:1 | Tx-S2 TO Tx-S5 | Tx-S3 TO Tx-S6 | NOT USED | NOT USED
1. "x" IS USED AS A WILDCARD.
e.g. Tx-S1 REFERS TO TERMINAL S1 OF T11 THROUGH T13.
2. T11 - T13 MUST BE CONNECTED IDENTICALLY.
T11
T12
T13
TOP VIEW
SOME DETAIL OMITTED FOR CLARITY.

FIGURE 3.2.4 305-AMX AND 308-AMX OUTPUT VOLTAGE CONFIGURATION

3.2.4 OUTPUT VOLTAGE RANGE CONFIGURATION, MODELS 305-AMX & 308-AMX

This paragraph describes the configuration of the Output Voltage Range for the Models 305-AMX and 308-AMX Power Sources. This model can be configured for either 0-135 $VAC_{l\text{-}n}$, 0-204 $VAC_{l\text{-}n}$, 0-273 $VAC_{l\text{-}n}$, or 0-341 $VAC_{l\text{-}n}$. The 0-204 VAC range is designated as the VR1.5 output form and the 0-273 VAC range is defined to be the VR2.0 output form. An Output Transformer Assembly is required for the 204, 273 and 341 VAC output forms. Installation of the VR1.5, VR2.0 or VR2.5 output forms is performed by the factory and can be installed on existing units not so equipped.

Refer to Figure 3.2.4 for voltage range tap selection information.

When the system is supplied with the VR1.5 output form, set the Transformer Ratio Switch of the UPC to 1.5. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.) The Transformer Ratio switch is set to 2.0 for systems configured with the VR2.0 output form. The Transformer Ratio switch is set to 2.5 for systems configured with the VR2.5 output form. The Transformer Ratio switch is set to 0.0 on systems not equipped with output transformers.

The Amps to Volts Ratio Switch of the UPC is always set to 6 in the Models 305-AMX and 308-AMX. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

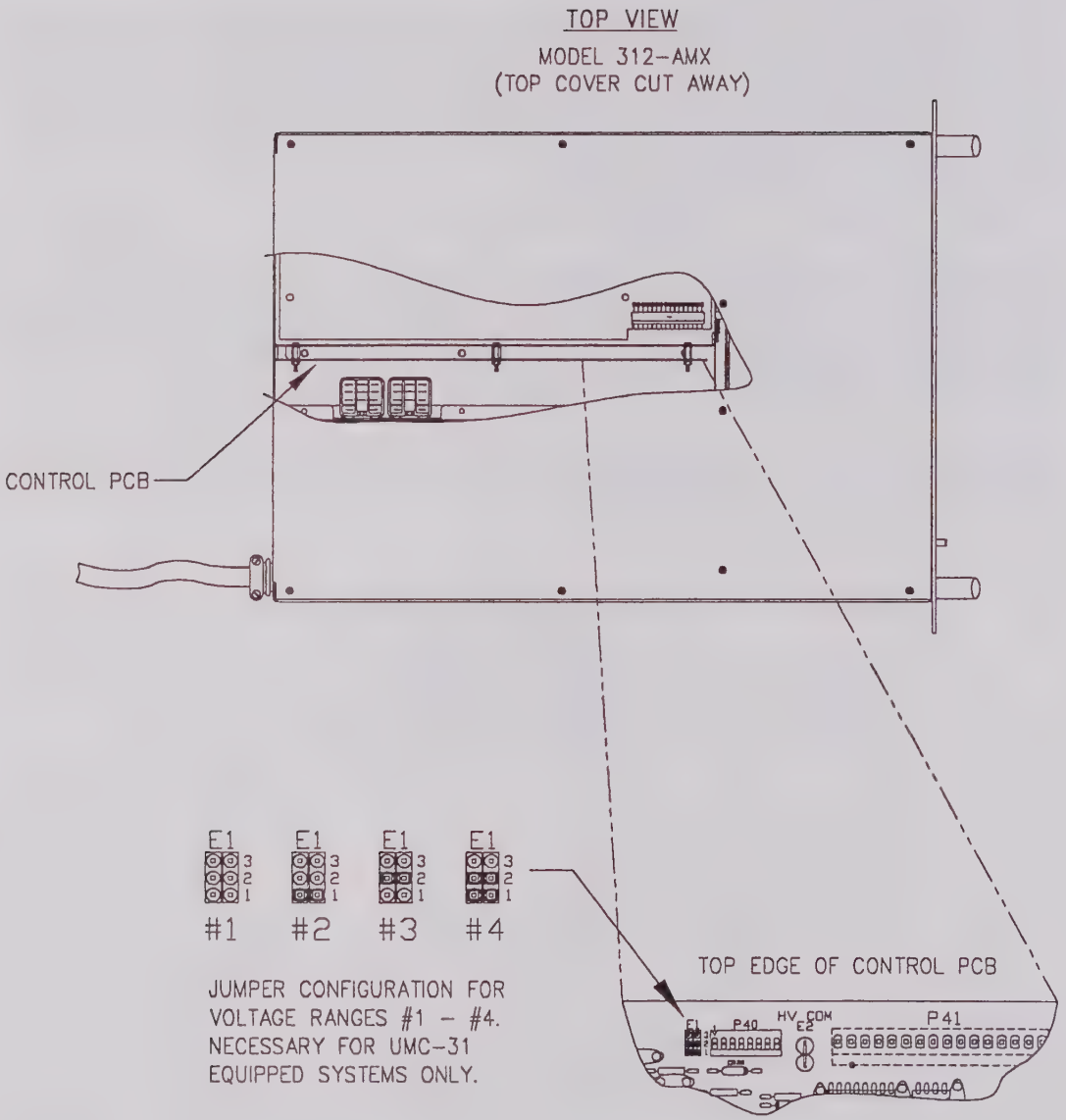

FIGURE 3.2.5(A) MODEL 312-AMX OUTPUT VOLTAGE RANGE CONFIGURATION JUMPER (E1) LOCATION

3.2.5 OUTPUT VOLTAGE RANGE CONFIGURATION, MODEL 312-AMX

This paragraph describes the configuration of the Output Voltage Range for the Model 312-AMX Power Source. This model can be configured for either 0-110 VAC_{l-n}, 0-125 VAC_{l-n}, 0-135 VAC_{l-n}, or 0-150 VAC_{l-n}. All ranges are direct-coupled outputs and are provided to maximize output current for a given output voltage. Range control is automatic for systems equipped with the UPC-32 controller. For systems equipped with the UMC-31 controller, configuration of the output form is performed by the factory per the original user requirements (0-150 VAC_{l-n} default) but may be changed as needed. Refer to figures 3.2.5(A) and (B) for instructions.

The Transformer Ratio Switch of the UPC is always set to 0.0 in this model. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

The Amps to Volts Ratio Switch of the UPC is always set to 6 in the Model 312-AMX. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

FIGURE 3.2.5(B)
MODEL 312-AMX
OUTPUT VOLTAGE RANGE CONFIGURATION

Model 312-AMX equipped with an UMC-31 controller must have the Range Control jumpers (E1-1,2) on the Control PCB Assy set to the appropriate AC Output Voltage range. The following table outlines the ranges and the appropriate tap selection.

AC Output Voltage Range 312-AMX 1 or 3 ϕ / 2 ϕ	E1-1	E1-2	Range	Rated AC Output Current 312-AMX 1 ϕ / 2 or 3 ϕ	Reg. DC Voltage
0-110 VAC_{l-n} / 0-220 VAC_{l-l}	Off	Off	#1	11.3 A/ 3.8 A	± 187 VDC
0-125 VAC_{l-n} / 0-250 VAC_{l-l}	On	Off	#2	10 A/ 3.3 A	± 203 VDC
0-135 VAC_{l-n} / 0-270 VAC_{l-l}	Off	On	#3	9 A/ 3.0 A	± 214 VDC
0-150 VAC_{l-n} / 0-300 VAC_{l-l}	On	On	#4	8.3 A/ 2.8 A	± 226 VDC

Refer to figure 3.2.5(B) for Control PCB and E1 location.

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3.2.6 OUTPUT VOLTAGE RANGE CONFIGURATION, MODEL 320-AMX

This paragraph describes the configuration of the Output Voltage Range for the Model 320-AMX Power Source. This model is configured with a 0-135 $VAC_{l\text{-}n}$ range. This range is a direct-coupled output.

The Transformer Ratio Switch of the UPC is always set to 0.0 in this model. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

The Amps to Volts Ratio Switch of the UPC is always set to 6 in the Model 320-AMX. (Refer to the *UPC-Series Operation Manual* for details. This does not apply to systems equipped with the UMC controller.)

WIRE TABLE

XFMR LEAD	CONNECTED TO OUTPUT VOLTAGE RANGE		
	VR1.5	VR2.0	VR2.5
Tx-1	TBx-4B	TBx-4B	TBx-4B
Tx-4	TBx-6B	TBx-6B	TBx-6B
Tx-5	TBx-1B	TBx-3B	TBx-3B
Tx-6	TBx-4A	TBx-4A	TBx-4A
Tx-7	TBx-1D	TBx-1B	TBx-2B
Tx-8	TBx-4C	TBx-3A	TBx-3A
Tx-9	TBx-1A	TBx-1A	TBx-1A
Tx-10	TBx-4D	TBx-3C	TBx-2A

1. "x" IS USED AS A WILDCARD.
   eg. TBx-1A REFERS TO TERMINAL 1A OF TB1 THROUGH TB6.

2. T1 - T6 MUST BE CONNECTED IDENTICALLY.

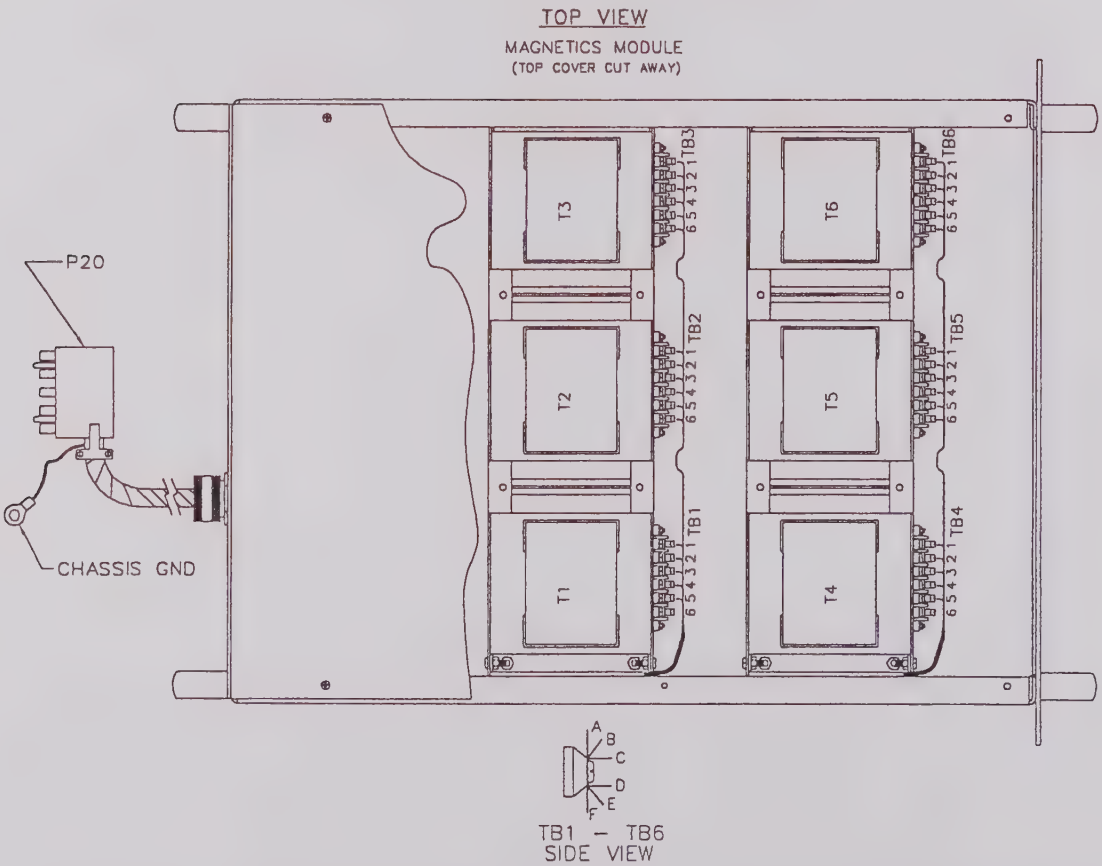


FIGURE 3.2.7 MODELS 140, 345, 360, 390, & 3120-AMX OUTPUT VOLTAGE CONFIGURATION

3.2.7 OUTPUT VOLTAGE RANGE CONFIGURATION, MODELS 140-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX

This paragraph describes the configuration of the Output Voltage Range for the Models 140, 345, 360, 390, and 3120-AMX Power Sources. These models can be configured for either 0-135 $VAC_{l\text{-}n}$, 0-204 $VAC_{l\text{-}n}$, 0-273 $VAC_{l\text{-}n}$, or 0-341 $VAC_{l\text{-}n}$. The 0-204 VAC range is designated as the VR1.5 output form. The 0-273 VAC range is defined to be the VR2.0 output form, and, finally, the 0-341 VAC range is defined to be the VR2.5 output form. A Magnetics Module (Assembly No. 134310) is required for the 204, 273 and 341 VAC output forms.

Refer to Figure 3.2.7 for location of components referenced below and range tap selection information.

Conversion to the 204 VAC Output Range (VR1.5) is as follows:

1) Remove the top cover of the Magnetics Module.
2) Wire for 1.5:1 ratio as per wire table of Figure 3.2.7.
3) Replace top cover of Magnetics Module.
4) Connect Magnetics Module to the power source. The Magnetics Module is connected to the power source by attaching P20 of the Magnetics Module to J20 of the power source. Also be sure to connect the Chassis GND wire of the Magnetics Module to the CHS GND stud on the rear panel of the power source.
5) Set the Transformer Ratio Switch of the UPC to 1.5. (Refer to the *UPC-Series Operation Manual* for details. This step does not apply to systems equipped with the UMC controller.) The Transformer Ratio switch is set to 0.0 on systems not equipped with output transformers.
6) Set the Amps to Volts Ratio Switch of the UPC to 15 for the Models 140-AMX, 345-AMX, and 360-AMX. Set the Amps to Volts Ratio Switch of the UPC to 30 for the Models 390-AMX and 3120-AMX. (Refer to the *UPC-Series Operation Manual* for details. This step does not apply to systems equipped with the UMC controller.)
7) Calibrate the power source as stated in Section 6 of this manual.

Conversion to the 273 VAC Output Range (VR2.0) proceeds as above, except that the Magnetics Module is wired for 2.0:1 ratio and Transformer Ratio Switch of the UPC is set for 2.0.

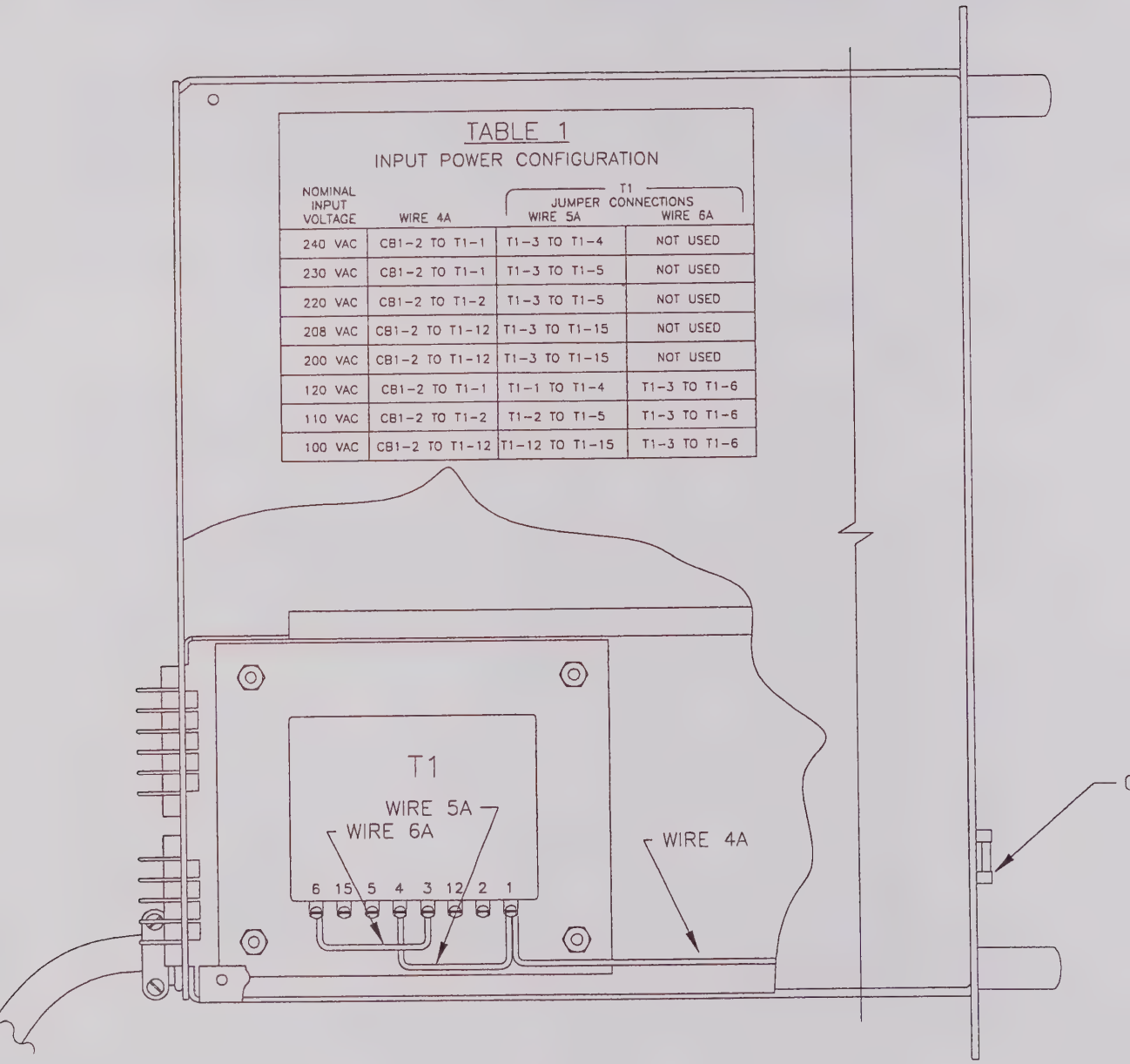
Likewise, conversion to the 341 V Output Range (VR2.5) proceeds as above, except that the Magnetics Module is wired for 2.5:1 ratio and Transformer Ratio Switch of the UPC is set for 2.5.

The Transformer Ratio Switch of the UPC is set to 0.0 on systems without transformer-coupled outputs.

While the above procedure can be performed in the field, Pacific Power Source recommends that the system be returned to the factory when transformer-coupled outputs are to be added to the system. This insures proper connection and calibration of the entire system.

TABLE 1
INPUT POWER CONFIGURATION

NOMINAL INPUT VOLTAGE	WIRE 4A	T1 JUMPER CONNECTIONS WIRE 5A	WIRE 6A
240 VAC	CB1-2 TO T1-1	T1-3 TO T1-4	NOT USED
230 VAC	CB1-2 TO T1-1	T1-3 TO T1-5	NOT USED
220 VAC	CB1-2 TO T1-2	T1-3 TO T1-5	NOT USED
208 VAC	CB1-2 TO T1-12	T1-3 TO T1-15	NOT USED
200 VAC	CB1-2 TO T1-12	T1-3 TO T1-15	NOT USED
120 VAC	CB1-2 TO T1-1	T1-1 TO T1-4	T1-3 TO T1-6
110 VAC	CB1-2 TO T1-2	T1-2 TO T1-5	T1-3 TO T1-6
100 VAC	CB1-2 TO T1-12	T1-12 TO T1-15	T1-3 TO T1-6



TOP VIEW

SOME DETAIL OMITTED FOR CLARITY.
120 VAC CONFIGURATION SHOWN

FIGURE 3.3.1 MODELS 105, 108, 305, AND 308-AMX INPUT VOLTAGE CONFIGURATION

3.3 INPUT POWER CONNECTION

This paragraph describes configuration of input voltage form and requirements of the input wiring for the AMX-Series Power Source. Since each model varies, each is discussed in a separate paragraph. Please refer to the appropriate paragraph for the model being configured.

3.3.1 INPUT VOLTAGE CONFIGURATION, MODELS 105-AMX, 108-AMX, 305-AMX, and 308-AMX

*** WARNING ***

- DISCONNECT THIS UNIT FROM THE INPUT SERVICE BEFORE REMOVING TOP COVER.
  HIGH VOLTAGE HAZARD PRESENT INSIDE UNIT WHEN TOP COVER IS REMOVED AND STILL CONNECTED TO INPUT SERVICE.

*** WARNING ***

These AMX Power Source has been designed to accept most standard single phase input voltage forms. This is accomplished through the use of a tapped, dual primary, input power transformer. Configuring the proper input form is simply a matter of setting jumpers in the appropriate positions. The system is designed for use with input frequencies of 47 to 63 Hz. (Optionally, the systems may be used with input frequencies of up to 440 Hz. Contact the factory for details.)

Figure 3.3.1 shows the location of the various jumpers which need attention relative to input voltage form. The position of these jumpers is listed on the accompanying table.

The first step in configuring the input power form is to remove the top cover. Next, connect the jumpers as stated in the table for the desired input voltage. Jumpers are located on the input power transformer (T1). Refer to the table in Figure 3.3.1 for the proper setting.

After configuring the input voltage form, check connections and insure that they are tight and in the correct position. Replace the top cover.

--- CAUTION ---

- CONNECTION OF THIS UNIT TO IMPROPER INPUT VOLTAGES WILL CAUSE CATASTROPHIC DAMAGE TO THE POWER SOURCE.

- READ THE INPUT VOLTAGE LABEL AND CONNECT TO THAT INPUT VOLTAGE ONLY. IF THERE ARE ANY QUESTIONS, CONTACT THE FACTORY.

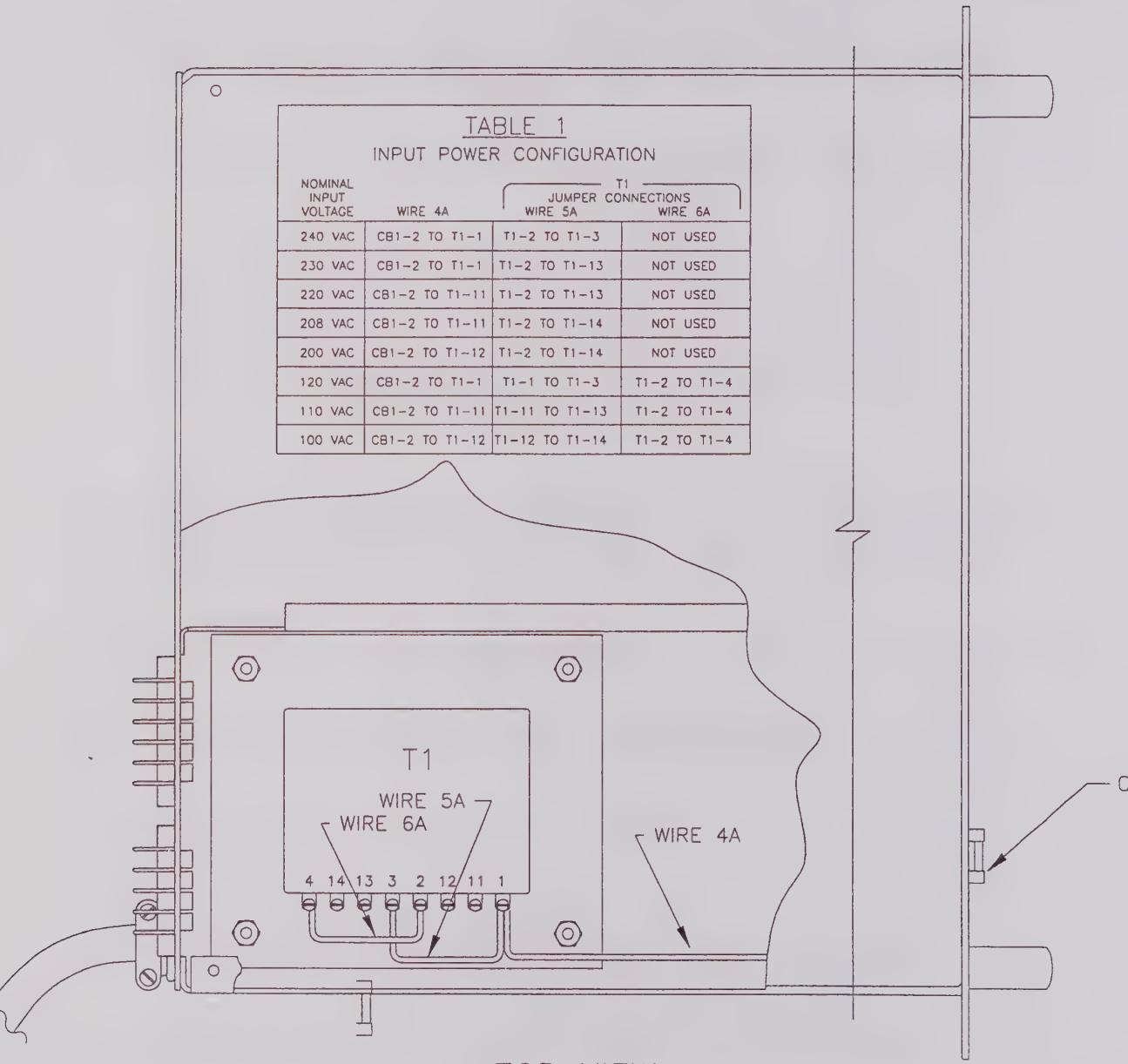
--- CAUTION ---

The AMX-Series Power Source is then connected to an appropriate outlet via the input power cord. Refer to Paragraph 2.1.1 for minimum input service requirements of the various input voltage forms.

TABLE 1

INPUT POWER CONFIGURATION

NOMINAL INPUT VOLTAGE	WIRE 4A	T1 JUMPER CONNECTIONS WIRE 5A	WIRE 6A
240 VAC	CB1-2 TO T1-1	T1-2 TO T1-3	NOT USED
230 VAC	CB1-2 TO T1-1	T1-2 TO T1-13	NOT USED
220 VAC	CB1-2 TO T1-11	T1-2 TO T1-13	NOT USED
208 VAC	CB1-2 TO T1-11	T1-2 TO T1-14	NOT USED
200 VAC	CB1-2 TO T1-12	T1-2 TO T1-14	NOT USED
120 VAC	CB1-2 TO T1-1	T1-1 TO T1-3	T1-2 TO T1-4
110 VAC	CB1-2 TO T1-11	T1-11 TO T1-13	T1-2 TO T1-4
100 VAC	CB1-2 TO T1-12	T1-12 TO T1-14	T1-2 TO T1-4



TOP VIEW

SOME DETAIL OMITTED FOR CLARITY.
120 VAC CONFIGURATION SHOWN

FIGURE 3.3.4 MODELS 112-AMX AND 312-AMX INPUT VOLTAGE CONFIGURATION

3.3.4 INPUT VOLTAGE CONFIGURATION, MODELS 112-AMX & 312-AMX

*** * * WARNING * * ***

- DISCONNECT THIS UNIT FROM THE INPUT SERVICE BEFORE REMOVING TOP COVER.
  HIGH VOLTAGE HAZARD PRESENT INSIDE UNIT WHEN TOP COVER IS REMOVED AND STILL CONNECTED TO INPUT SERVICE.

*** * * WARNING * * ***

The 112 and 312-AMX Power Sources have been designed to accept either the 120 or 240 VAC single phase input voltage forms. This is accomplished through the use of a tapped, dual primary, input power transformer. Configuring the proper input form is simply a matter of setting jumpers in the appropriate positions. The system is designed for use with input frequencies of 47 to 63 Hz.

Figure 3.3.4 shows the location of the various jumpers which need attention relative to input voltage form. The position of these jumpers is listed on the accompanying table.

The first step in configuring the input power form is to remove the top cover. Next, connect the jumpers as stated in the table for the desired input voltage. Jumpers are located on the input power transformer (T1). Refer to the table in Figure 3.3.4 for the proper setting.

After configuring the input voltage form, check connections and insure that they are tight and in the correct position. Replace the top cover.

--- CAUTION ---

- CONNECTION OF THIS UNIT TO IMPROPER INPUT VOLTAGES WILL CAUSE CATASTROPHIC DAMAGE TO THE POWER SOURCE.

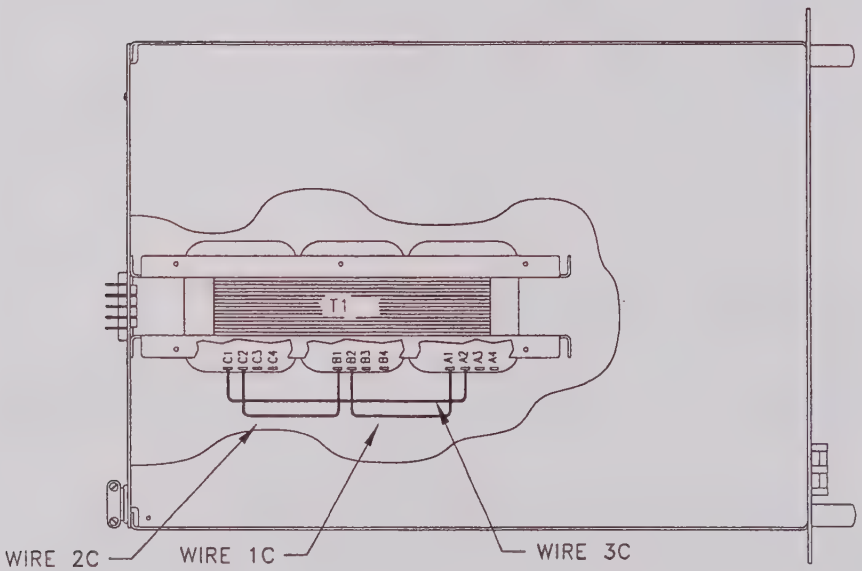
- READ THE INPUT VOLTAGE LABEL AND CONNECT TO THAT INPUT VOLTAGE ONLY. IF THERE ARE ANY QUESTIONS, CONTACT THE FACTORY.

--- CAUTION ---

The 112 or 312-AMX is then connected to an appropriate outlet via the input power cord. Refer to Paragraph 2.1.1 for minimum input service requirements of the various input voltage forms.

TABLE 1
INPUT POWER CONFIGURATION

NOMINAL INPUT VOLTAGE	T1 JUMPER CONNECTIONS WIRE 1C	WIRE 2C	WIRE 3C
277/480 VAC	REFER TO SECTION 9, MODIFICATIONS		
240/416 VAC	T1-C4 TO T1-A4	T1-A4 TO T1-B4	T1-B4 TO T1-C4
220/380 VAC	T1-C3 TO T1-A3	T1-A3 TO T1-B3	T1-B3 TO T1-C3
240 VAC DELTA	T1-C4 TO T1-A1	T1-A4 TO T1-B1	T1-B4 TO T1-C1
220 VAC DELTA	T1-C3 TO T1-A1	T1-A3 TO T1-B1	T1-B3 TO T1-C1
208 VAC DELTA	T1-C2 TO T1-A1	T1-A2 TO T1-B1	T1-B2 TO T1-C1



TOP VIEW

SOME DETAIL OMITTED FOR CLARITY
208 DELTA CONFIGURATION SHOWN

FIGURE 3.3.5 MODEL 320-AMX INPUT VOLTAGE CONFIGURATION

3.3.5 INPUT VOLTAGE CONFIGURATION, MODEL 320-AMX

*** * * WARNING * * ***

- DISCONNECT THIS UNIT FROM THE INPUT SERVICE BEFORE REMOVING TOP COVER.
  HIGH VOLTAGE HAZARD PRESENT INSIDE UNIT WHEN TOP COVER IS REMOVED AND STILL CONNECTED TO INPUT SERVICE.

*** * * WARNING * * ***

The 320-AMX Power Source has been designed to accept most standard three phase input voltage forms. This is accomplished through the use of a tapped input power transformer. Configuring the proper input form is simply a matter of setting jumpers in the appropriate positions. The system is designed for use with input frequencies of 47 to 63 Hz. (Optionally, the system may be used with input frequencies of up to 440 Hz. Contact the factory for details.)

Figure 3.3.5 shows the location of the various jumpers which need attention relative to input voltage form. The position of these jumpers is listed on the accompanying table.

The first step in configuring the input power form is to remove the top cover. Next, connect the jumpers as stated in the table for the desired input voltage. Refer to the table in Figure 3.3.5 for the proper setting.

After configuring the input voltage form, check connections and insure that they are tight and in the correct position. Replace the top cover.

--- CAUTION ---

- CONNECTION OF THIS UNIT TO IMPROPER INPUT VOLTAGES WILL CAUSE CATASTROPHIC DAMAGE TO THE POWER SOURCE.

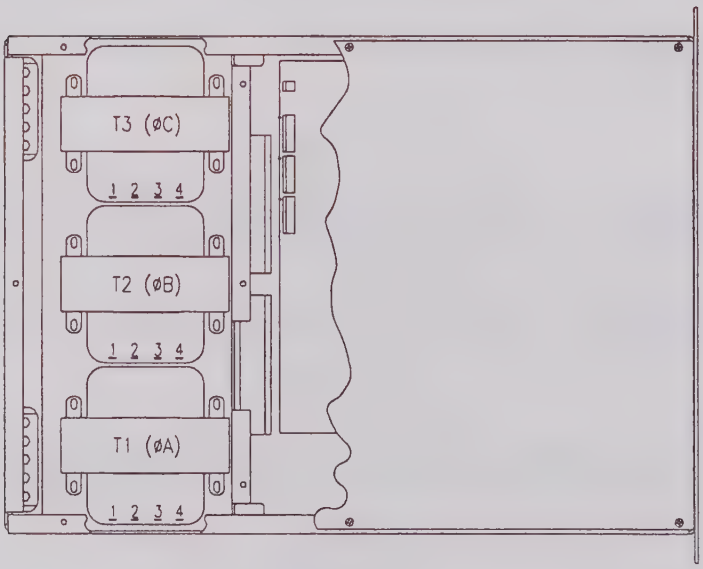
- READ THE INPUT VOLTAGE LABEL AND CONNECT TO THAT INPUT VOLTAGE ONLY. IF THERE ARE ANY QUESTIONS, CONTACT THE FACTORY.

--- CAUTION ---

The 320-AMX is then connected to an appropriate distribution panel via the input power cord. Refer to Paragraph 2.1.1 for minimum input service requirements of the various input voltage forms.

TABLE 1

INPUT VOLTAGE FORM	FROM HARNESS	JUMPERS XFMR TO XFMR
208 VAC DELTA	(øA) WIRE TO T1-1 (øB) WIRE TO T2-1 (øC) WIRE TO T3-1	JUMPER T1-1 TO T2-2 JUMPER T2-1 TO T3-2 JUMPER T3-1 TO T1-2
220 VAC DELTA	(øA) WIRE TO T1-1 (øB) WIRE TO T2-1 (øC) WIRE TO T3-1	JUMPER T1-1 TO T2-3 JUMPER T2-1 TO T3-3 JUMPER T3-1 TO T1-3
240 VAC DELTA	(øA) WIRE TO T1-1 (øB) WIRE TO T2-1 (øC) WIRE TO T3-1	JUMPER T1-1 TO T2-4 JUMPER T2-1 TO T3-4 JUMPER T3-1 TO T1-4
220/380 VAC	(øA) WIRE TO T1-3 (øB) WIRE TO T2-3 (øC) WIRE TO T3-3	JUMPER T1-1 TO T3-1 JUMPER T2-1 TO T1-1 JUMPER T3-1 TO T2-1
240/416 VAC	(øA) WIRE TO T1-4 (øB) WIRE TO T2-4 (øC) WIRE TO T3-4	JUMPER T1-1 TO T3-1 JUMPER T2-1 TO T1-1 JUMPER T3-1 TO T2-1
277/480 VAC	REFER TO SECTION 9, MODIFICATIONS	



TOP VIEW

MODEL 125-AMX
(TOP COVER CUT-AWAY)

NOTES:
1. SOME DETAIL OMITTED FOR CLARITY.

FIGURE 3.3.6 MODEL 125-AMX INPUT VOLTAGE CONFIGURATION

3.3.6 INPUT VOLTAGE CONFIGURATION, MODEL 125-AMX

*** * * WARNING * * ***

- DISCONNECT THIS UNIT FROM THE INPUT SERVICE BEFORE REMOVING TOP COVER.
  HIGH VOLTAGE HAZARD PRESENT INSIDE UNIT WHEN TOP COVER IS REMOVED AND STILL CONNECTED TO INPUT SERVICE.

*** * * WARNING * * ***

The 125-AMX Power Source has been designed to accept most standard three phase input voltage forms. This is accomplished through the use of tapped input power transformers. Configuring the proper input form is simply a matter of setting jumpers in the appropriate positions. The system is designed for use with input frequencies of 47 to 63 Hz. (Optionally, the system may be used with input frequencies of up to 440 Hz. Contact the factory for details.)

Figure 3.3.6 shows the location of the various jumpers which need attention relative to input voltage form. The position of these jumpers is listed on the accompanying table.

The first step in configuring the input power form is to remove the top cover. Next, connect the jumpers as stated in the table for the desired input voltage. Refer to the table in Figure 3.3.6 for the proper setting.

After configuring the input voltage form, check connections and insure that they are tight and in the correct position. Replace the top cover.

--- CAUTION ---

- CONNECTION OF THIS UNIT TO IMPROPER INPUT VOLTAGES WILL CAUSE CATASTROPHIC DAMAGE TO THE POWER SOURCE.

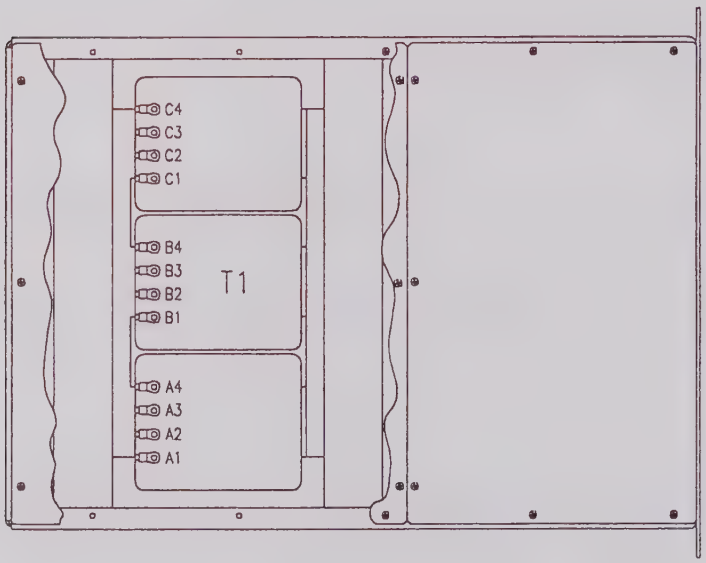
- READ THE INPUT VOLTAGE LABEL AND CONNECT TO THAT INPUT VOLTAGE ONLY. IF THERE ARE ANY QUESTIONS, CONTACT THE FACTORY.

--- CAUTION ---

The 125-AMX is then connected to an appropriate distribution panel via the input power cord. Refer to Paragraph 2.1.1 for minimum input service requirements of the various input voltage forms.

TABLE 1

INPUT VOLTAGE FORM	FROM HARNESS	JUMPERS XFMR TO XFMR
208 VAC DELTA	(øA) WIRE TO T1-A1 (øB) WIRE TO T1-B1 (øC) WIRE TO T1-C1	JUMPER T1-A1 TO T1-C2 JUMPER T1-B1 TO T1-A2 JUMPER T1-C1 TO T1-B2
220 VAC DELTA	(øA) WIRE TO T1-A1 (øB) WIRE TO T1-B1 (øC) WIRE TO T1-C1	JUMPER T1-A1 TO T1-C3 JUMPER T1-B1 TO T1-A3 JUMPER T1-C1 TO T1-B3
240 VAC DELTA	(øA) WIRE TO T1-A1 (øB) WIRE TO T1-B1 (øC) WIRE TO T1-C1	JUMPER T1-A1 TO T1-C4 JUMPER T1-B1 TO T1-A4 JUMPER T1-C1 TO T1-B4
220/380 VAC	(øA) WIRE TO T1-A1 (øB) WIRE TO T1-B1 (øC) WIRE TO T1-C1	JUMPER T1-A3 TO T1-C3 JUMPER T1-B3 TO T1-A3 JUMPER T1-C3 TO T1-B3
240/416 VAC	(øA) WIRE TO T1-A1 (øB) WIRE TO T1-B1 (øC) WIRE TO T1-C1	JUMPER T1-A4 TO T1-C4 JUMPER T1-B4 TO T1-A4 JUMPER T1-C4 TO T1-B4
277/480 VAC	REFER TO SECTION 9, MODIFICATIONS	



TOP VIEW

NOTES:
1. SOME DETAIL OMITTED FOR CLARITY.

MODELS 140, 345, 360, 390, AND 3120-AMX
(TOP COVER CUT-AWAY)

FIGURE 3.3.7 MODELS 140, 345, 360, 390, AND 3120-AMX INPUT VOLTAGE CONFIGURATION

3.3.7 INPUT VOLTAGE CONFIGURATION, MODELS 140-AMX, 345-AMX, 360-AMX, 390-AMX, & 3120-AMX

* * * WARNING * * *

- DISCONNECT THIS UNIT FROM THE INPUT SERVICE BEFORE REMOVING TOP COVER.
  HIGH VOLTAGE HAZARD PRESENT INSIDE UNIT WHEN TOP COVER IS REMOVED AND STILL CONNECTED TO INPUT SERVICE.

* * * WARNING * * *

The 140-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX Power Sources have been designed to accept most standard three phase input voltage forms. This is accomplished through the use of a tapped input power transformer. Configuring the proper input form is simply a matter of setting jumpers in the appropriate positions. The system is designed for use with input frequencies of 47 to 63 Hz. (Optionally, the systems may be used with input frequencies of up to 440 Hz. Contact the factory for details.)

Figure 3.3.7 shows the location of the various jumpers which need attention relative to input voltage form. The position of these jumpers is listed on the accompanying table.

The first step in configuring the input power form is to remove the top cover. Next, connect the jumpers as stated in the table for the desired input voltage. Refer to the table in Figure 3.3.7 for the proper setting.

After configuring the input voltage form, check connections and insure that they are tight and in the correct position. Replace the top cover.

--- CAUTION ---

- CONNECTION OF THIS UNIT TO IMPROPER INPUT VOLTAGES WILL CAUSE CATASTROPHIC DAMAGE TO THE POWER SOURCE.

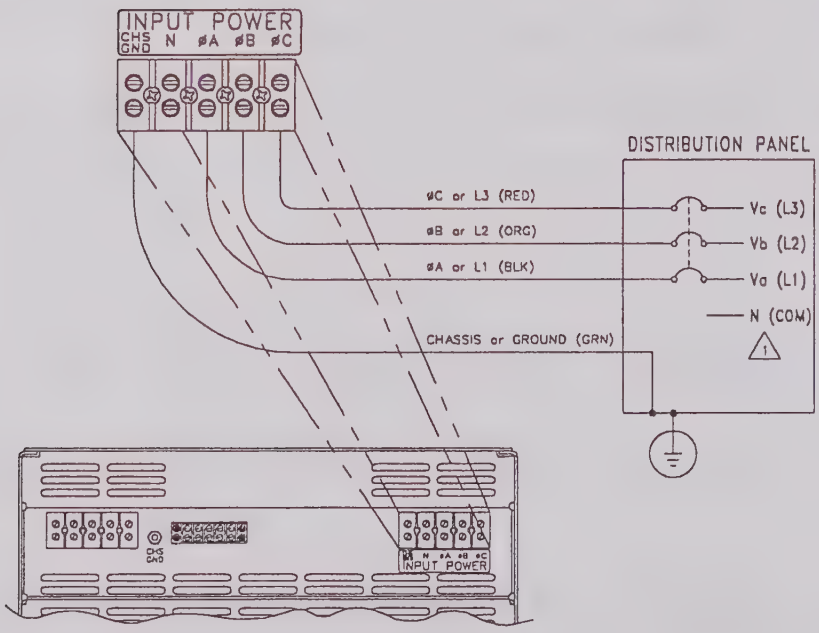
- READ THE INPUT VOLTAGE LABEL AND CONNECT TO THAT INPUT VOLTAGE ONLY. IF THERE ARE ANY QUESTIONS, CONTACT THE FACTORY.

--- CAUTION ---

The AMX-Series Power Source is then connected to an appropriate distribution panel via an input power cord. Refer to Paragraph 2.1.1 for minimum input service requirements of the various input voltage forms.

WIRE TABLE

INPUT VOLTAGE FORM	MINIMUM WIRE SIZE MODEL 125-AMX	MODEL 140-AMX	MODEL 345-AMX 360-AMX 390-AMX 3120-AMX
208 VAC DELTA	12 AWG THWN or SO-10-4	10 AWG THWN or SO-8-4	8 AWG THWN or SO-4-4
220 VAC DELTA	12 AWG THWN or SO-10-4	10 AWG THWN or SO-8-4	8 AWG THWN or SO-4-4
240 VAC DELTA	12 AWG THWN or SO-10-4	10 AWG THWN or SO-8-4	8 AWG THWN or SO-4-4
220/380 VAC	14 AWG THWN or SO-12-5	12 AWG THWN or SO-10-5	12 AWG THWN or SO-8-5
240/416 VAC	14 AWG THWN or SO-12-5	12 AWG THWN or SO-10-5	12 AWG THWN or SO-8-5
277/480 VAC	14 AWG THWN or SO-12-5	12 AWG THWN or SO-10-5	12 AWG THWN or SO-8-5



MODELS 125, 140, 345, 360, 390 & 3120-AMX

REAR VIEW

2. WIRE SIZES BASED ON TABLE 310-16 OF THE 1990 NATIONAL ELECTRIC CODE (NEC), AND AMBIENT TEMPERATURE OF 30 C.

1. NEUTRAL WIRE IS NOT USED.

NOTES

FIGURE 3.3.8 AMX-SERIES INPUT WIRING DIAGRAM

3.3.8 INPUT POWER WIRING REQUIREMENTS

This paragraph describes the input wiring requirements for the AMX-Series Power Sources. Wire size and connection techniques are discussed.

*** * * WARNING * * ***

- LETHAL VOLTAGE PRESENT AT INPUT TERMINALS OF THIS MACHINE.
- ALWAYS CONNECT "**CHS or GND**" TERMINAL TO EARTH POTENTIAL. FAILURE TO DO SO WILL CREATE A SHOCK HAZARD.

*** * * WARNING * * ***

The Models 105-AMX, 108-AMX, 112-AMX, 305-AMX, 308-AMX, 312-AMX, and 320-AMX are supplied with an input power cord. Install an appropriate plug onto the end of the power cord and connect to the proper outlet. Refer to paragraph 2.1.1 for recommended input service of the configured input voltage form.

The input power of the Models 125-AMX, 140-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX is connected to the Input Power Terminal Block located on the rear panel of the power source. In this case the input wiring is brought to this terminal block from the distribution panel. The connection points are labeled "**A**," "**B**," "**C**," "**N**," and "**CHS**." The input wiring is connected to these points in the appropriate order with **CHS** being the safety ground or earth potential. The AMX-Series Power Source is not sensitive to phase rotation of the input voltage. For all standard DELTA input voltage forms (208, 220, and 240 VAC) and WYE input voltage forms (220/380 VAC, 240/416 VAC, and 277/480 VAC), the "N" terminal is not used. Refer to Figure 3.3.8 for the proper wire size to be used with the configured input power form.

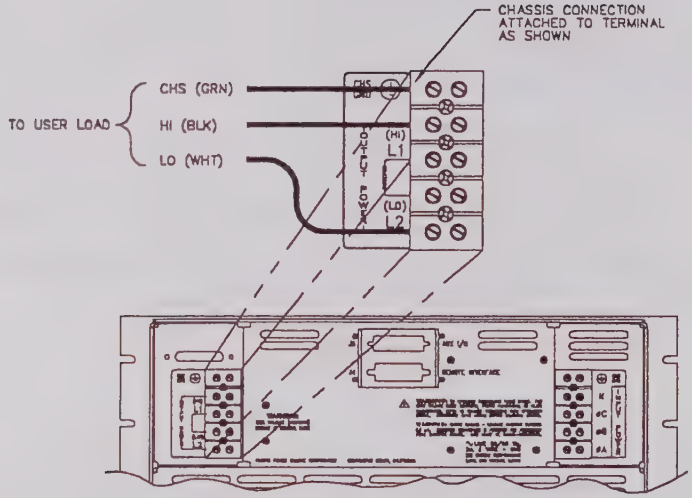
--- CAUTION ---

- CONNECTION OF THIS UNIT TO IMPROPER INPUT VOLTAGES WILL CAUSE CATASTROPHIC DAMAGE TO THE POWER SOURCE.
- READ THE INPUT VOLTAGE LABEL AND CONNECT TO THAT INPUT VOLTAGE ONLY.
  IF THERE ARE ANY QUESTIONS, CONTACT THE FACTORY.

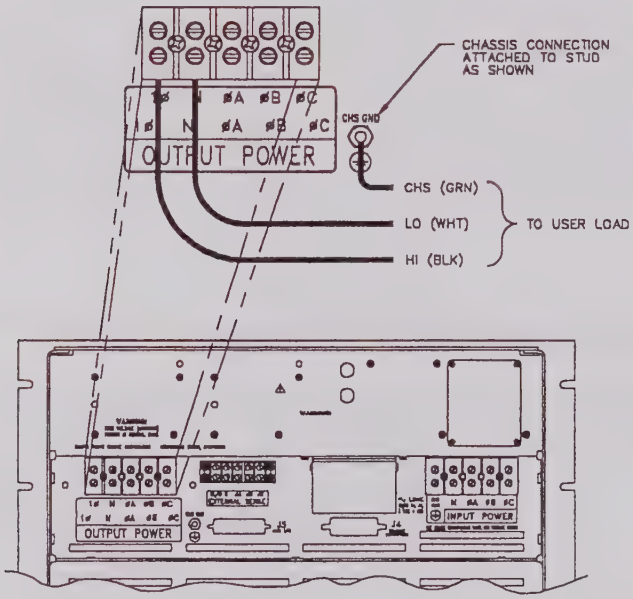
--- CAUTION ---

NOTE:

It is the user's responsibility to meet all local and national electrical codes when installing this equipment.

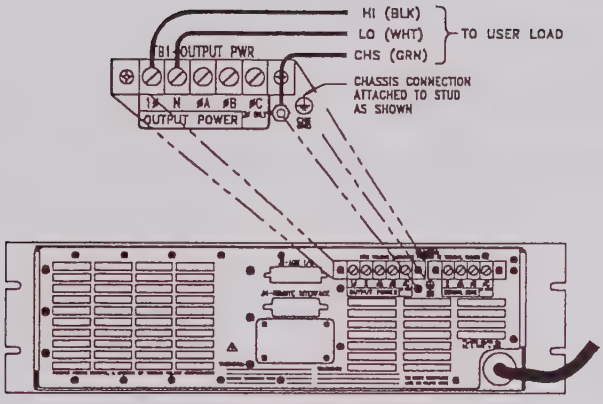


MODEL 125-AMX
REAR VIEW

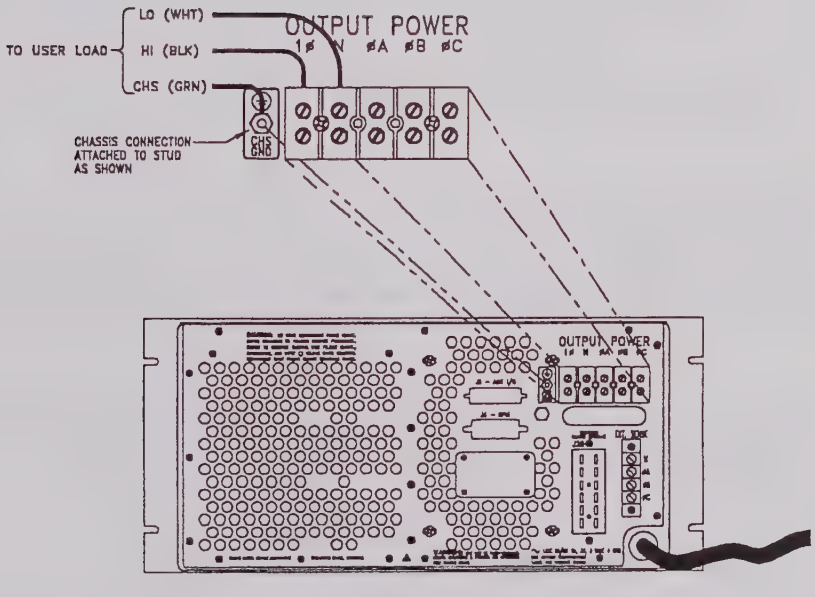


MODELS 140, 345, 360, 390, & 3120-AMX
REAR VIEW

FIGURE 3.4.1.1 MODELS 125, 140, 345, 360, 390, AND 3120-AMX SINGLE PHASE OUTPUT CONNECTION



MODELS 105, 108, 112, 305, 308, & 312-AMX
REAR VIEW



MODEL 320-AMX
REAR VIEW

FIGURE 3.4.1.2 MODELS 105, 108, 112, 305, 308, 312, AND 320-AMX SINGLE PHASE OUTPUT CONNECTION

3.4 OUTPUT POWER CONNECTION

This paragraph describes connection of the load to the AMX-Series Power Source.

3.4.1 SINGLE PHASE OUTPUT

This paragraph describes the wiring requirements for a single phase load. Figures 3.4.1.1 and 3.4.1.2 show a single phase load connected to the output of an AMX-Series Power Source.

*** * * WARNING * * ***

- LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !
- REFER OUTPUT CONNECTION TO A QUALIFIED ELECTRICIAN.

*** * * WARNING * * ***

The output power is taken from the terminal block located on the rear panel of the chassis labeled "**OUTPUT POWER**." The Output Form is set for **1 PHASE** when this type of load is attached.

The high side of the load is connected to the "**1ϕ**" terminal (the "**L1**" terminal on the Model 125-AMX) when making connections to an AMX-Series Power Source. The "**N**" (the "**L2**" terminal on the Model 125-AMX) terminal is the low side of the output. The low side of the load connected to this terminal in all models.

The "**CHS**" terminal ***must always*** be connected to the chassis of the load. Since the output is isolated, either output terminal (*direct-coupled output only*) may be connected to chassis. This allows the user to re-establish a local ground for the output. The output (preferably Neutral) must be referenced to chassis somewhere. Unless demanded otherwise by a particular application, Pacific Power Source recommends that a jumper be installed across the "**N**" ("**L2**" for Model 125-AMX) and "**CHS**" terminals of the Output Terminal block.

The "**N**" terminal of the Output Power Terminal Block ***must always*** be connected to the "**CHS**" terminal when using transformer-coupled outputs. Refer to Paragraph 3.4.4 for special considerations when using transformer-coupled output forms.

Refer to Paragraph 3.7 for connection of the External Sense Input, when used.

NOTE: It is the user's responsibility to meet all local and national electrical codes when installing this equipment.

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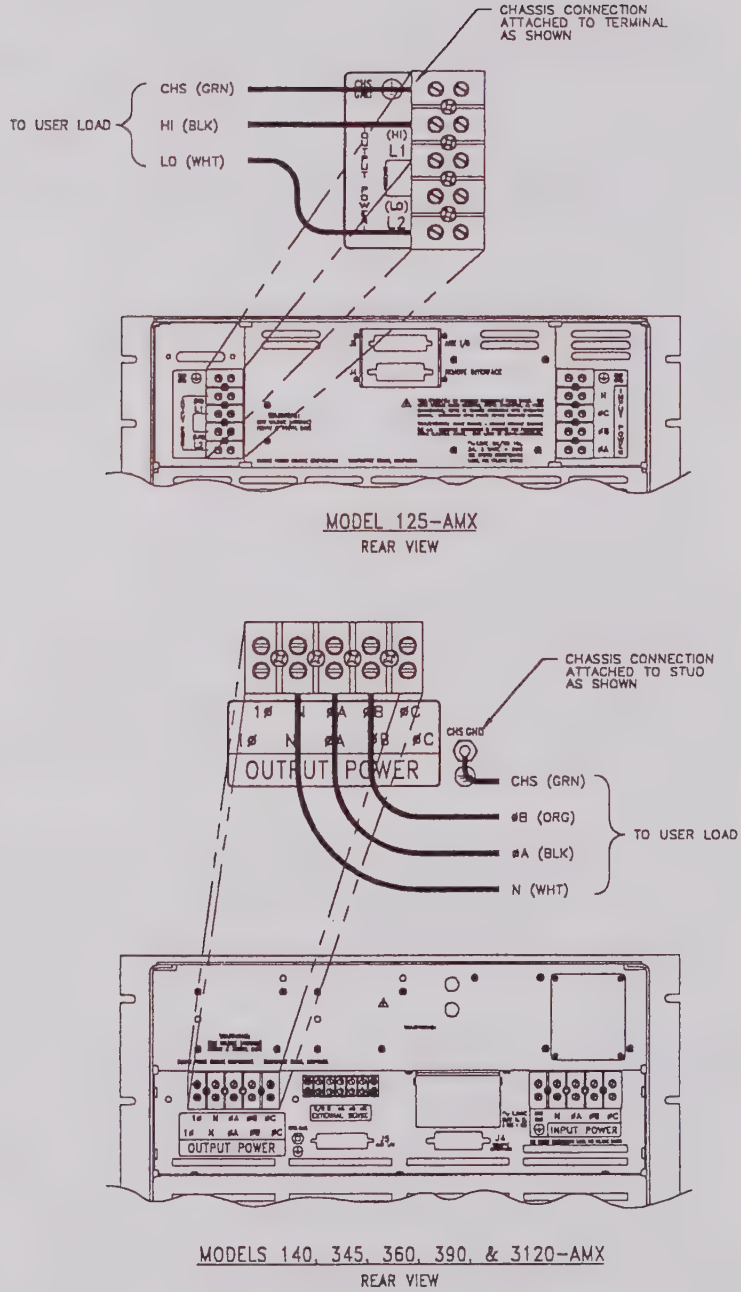
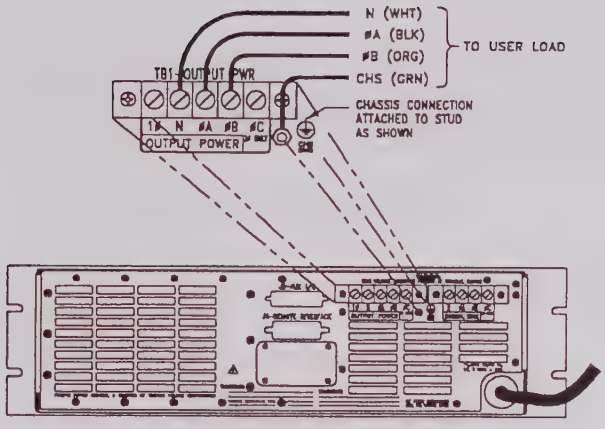
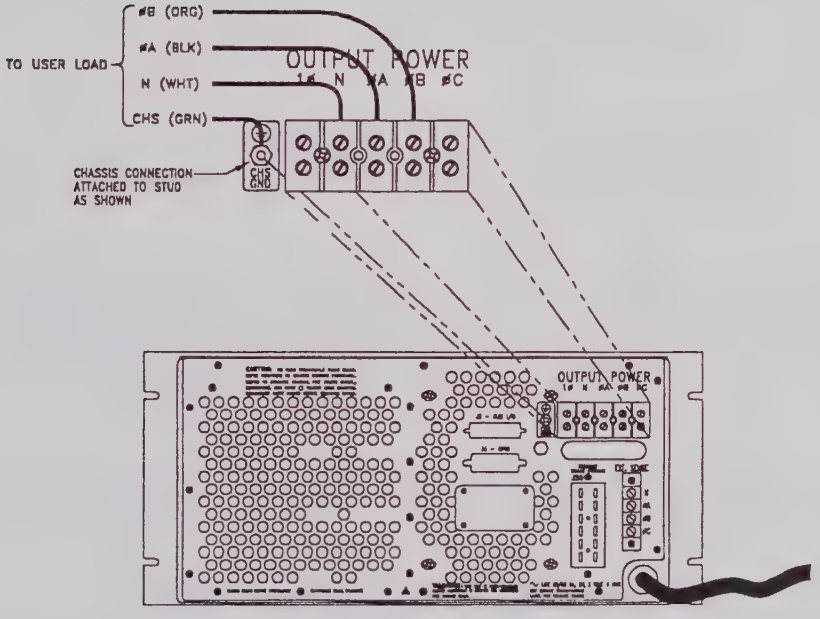


FIGURE 3.4.2.1 MODELS 125, 140, 345, 360, 390, AND 3120-AMX SPLIT PHASE OUTPUT CONNECTION



MODELS 105, 108, 112, 305, 308, & 312-AMX
REAR VIEW



MODEL 320-AMX
REAR VIEW

FIGURE 3.4.2.2 MODELS 105, 108, 112, 305, 308, 312, AND 320-AMX SPLIT PHASE OUTPUT CONNECTION

3.4.2 SPLIT PHASE OUTPUT

This paragraph describes the wiring requirements for 220 VAC, 1ϕ, direct-coupled or split phase loads. Figures 3.4.2.1 and 3.4.2.2 show a split phase load connected to the output of an AMX-Series Power Source. Split Phase or 2 Phase operation is defined to be two voltage vectors (V_a and V_b) which are equal in magnitude and separated by 180°.

*** * * WARNING * * ***

- LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !
- REFER OUTPUT CONNECTION TO A QUALIFIED ELECTRICIAN.

*** * * WARNING * * ***

The output power is taken from the terminal block located on the rear panel of the chassis labeled "**OUTPUT POWER**." The Output Form is set for **2 PHASE** when this type of load is attached.

This power form has a direct-coupled voltage range of 0-270 VAC_{l-l} (0-300 VAC_{l-l} on 112/312/125-AMX) and is well-suited for driving 220 VAC single phase loads. In this case, the high side of the load is connected to the "**ϕA**" terminal (the "**L1**" terminal on the Model 125-AMX) and the low side of the load to the "**ϕB**" terminal (the "**L2**" terminal on the Model 125-AMX). The "**N**" terminal is not used with this type of load.

Some loads require three connections (V_a-N-V_b or L_1-N-L_2). This type of load is commonly referred to as the "Split Phase" type—not available with the Model 125-AMX. In this case, the "**N**" terminal of the output terminal block is used in addition to the wiring described above. Refer to Figures 3.4.2.1 and 3.4.2.2 for connection details.

The "**CHS**" terminal *must always* be connected to the chassis of the load. Since the output is isolated, any output terminal (*direct-coupled output only*) may be connected to chassis. This allows the user to re-establish a local ground for the output. The output (preferably Neutral) must be referenced to chassis somewhere. Unless demanded otherwise by a particular application, Pacific Power Source recommends that a jumper be installed across the "**N**" ("**L2**" terminal for Model 125-AMX) and "**CHS**" terminals of the Output Terminal block.

The "**N**" terminal of the Output Power Terminal Block ***must always*** be connected to the "**CHS**" terminal when using transformer-coupled outputs. Refer to Paragraph 3.4.4 for special considerations when using transformer-coupled output forms.

Refer to Paragraph 3.7 for connection of the External Sense Input, when used.

NOTE: It is the user's responsibility to meet all local and national electrical codes when installing this equipment.

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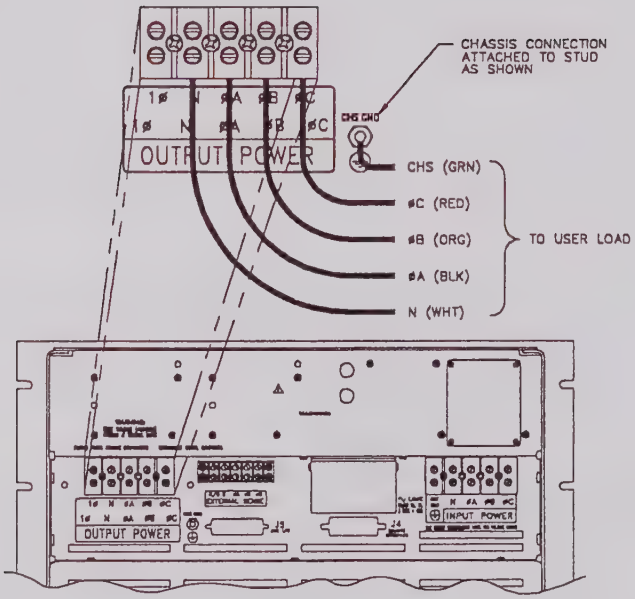
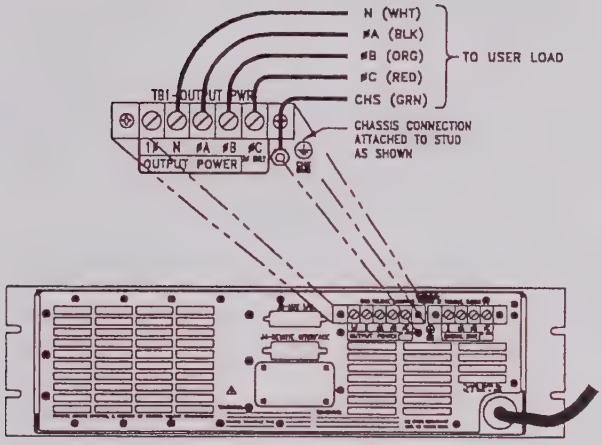


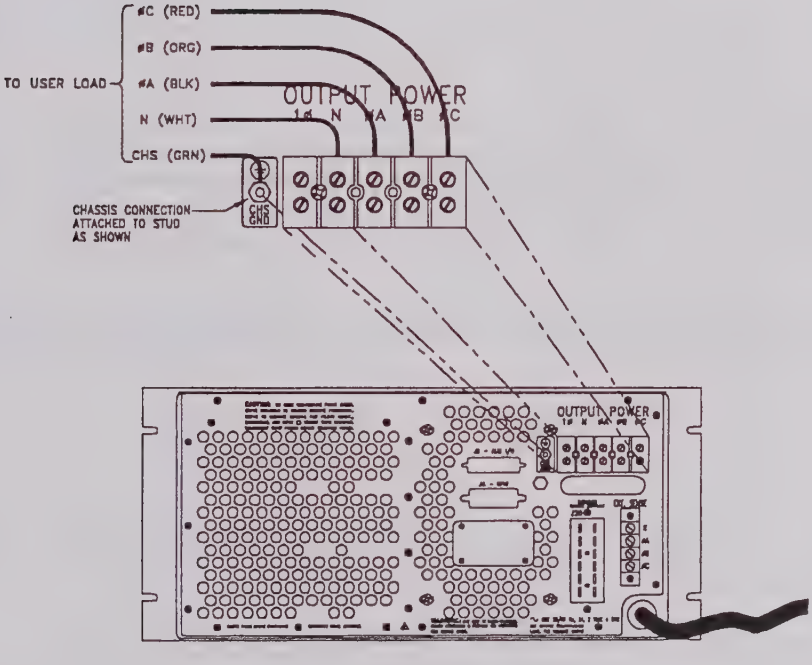
MODELS 345, 360, 390, & 3120-AMX
REAR VIEW

FIGURE 3.4.3.1 MODELS 345, 360, 390, AND 3120-AMX THREE PHASE OUTPUT CONNECTION



MODELS 105, 108, 112, 305, 308, & 312-AMX

REAR VIEW



MODEL 320-AMX

REAR VIEW

FIGURE 3.4.3.2 MODELS 105, 108, 112, 305, 308, 312, AND 320-AMX THREE PHASE OUTPUT CONNECTION

3.4.3 THREE PHASE OUTPUT

This paragraph describes the wiring requirements for three phase loads (WYE or DELTA). Figures 3.4.3.1 and 3.4.3.2 show a three phase load connected to the output of an AMX-Series 3ϕ Power Source.

*** * * WARNING * * ***

- LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !
- REFER OUTPUT CONNECTION TO A QUALIFIED ELECTRICIAN.

*** * * WARNING * * ***

The output power is taken from the terminal block located on the rear panel of the chassis labeled "**OUTPUT POWER**". This Output Form is set for **3 PHASE** when these types of load are connected.

This power form has a direct-coupled voltage range of 0-135 $VAC_{l\text{-}n}$. WYE loads are connected to "**ϕA**," "**ϕB**," "**ϕC**," and "**N**" terminals as shown in Figures 3.4.3.1 and 3.4.3.2. In the case of DELTA loads, the "**N**" terminal is not used.

The "**CHS**" terminal *must always* be connected to the chassis of the load. Since the output is isolated, any output terminal (*direct-coupled output only*) may be connected to chassis. This allows the user to re-establish a local ground for the output. The output (preferably Neutral) must be referenced to chassis somewhere. Unless demanded otherwise by a particular application, Pacific Power Source recommends that a jumper be installed across the "**N**" and "**CHS**" terminals of the Output Terminal block.

The "**N**" terminal of the Output Power Terminal Block *must always* be connected to the "**CHS**" terminal when using transformer-coupled outputs. Refer to Paragraph 3.4.4 for special considerations when using transformer-coupled output forms.

Refer to Paragraph 3.7 for connection of the External Sense Input, when used.

NOTE: It is the user's responsibility to meet all local and national electrical codes when installing this equipment.

3.4.4 TRANSFORMER OUTPUTS - SPECIAL CONSIDERATIONS

OUTPUT GROUNDING

The output of the AMX-Series Power Source is electrically isolated from the input power and earth ground. This allows the user to establish a local ground for the output of the Power Source. The AMX-Series Power Source is designed to withstand voltage potentials of 150 VAC across the Neutral output terminal and chassis ground.

When using the direct-coupled outputs, any leg or neutral may be connected to chassis. This is because the line to neutral voltage cannot exceed 150 VAC. Hence, the voltage stress from neutral to chassis never exceeds designed limits.

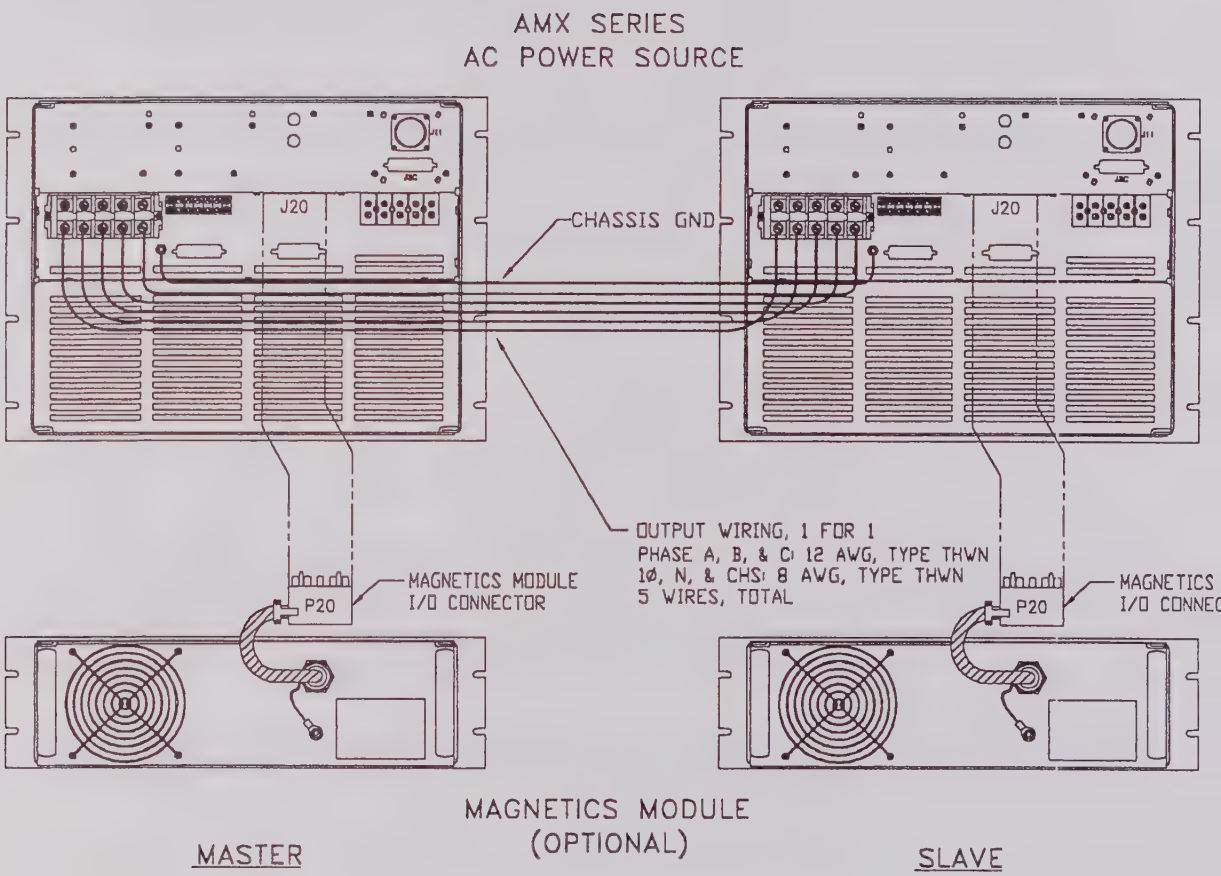
In the case of transformer-coupled outputs, neutral ***must*** be connected to chassis gnd (either locally or remotely). This is due to the fact that line to neutral voltages can be greater than 150 VAC. If a phase voltage (V_a, V_b, or V_c) were connected to chassis, the voltage would exceed the 150 VAC limit specified for the neutral to chassis voltage. Neutral must remain within 150 VAC of chassis (earth ground) at all times.

LOW FREQUENCY OPERATION

AMX-Series output transformers are designed to operate from 45 to 5,000 Hz. In the case of steady-state sine wave output, operation at frequencies as low as 30 Hz (125 VAC V_{pri}) is possible.

Systems with transformers connected to the output require special attention when designing transient profiles (applicable to systems w/UPC). It is possible to design transients in which the DC Component of the periodic waveform is not zero. Attempting to push DC voltage through the transformer will cause saturation of the device. However, the output transformers are designed to support a single event, half-cycle dropout at 125 VAC_{pri}, 50 Hz without saturating. Continuous operation with an asymmetrical (DC component $\neq 0$) will cause saturation.

Operation at lower frequencies may cause saturation of the output transformers. Lower frequency operation is possible, but only at reduced output voltages.



2. WIRE SIZES BASED ON TABLE 310-16 OF THE 1990 NATIONAL ELECTRIC CODE (NEC), AND AMBIENT TEMPERATURE OF 30° C.
1. CABLES J11 AND J3C OMITTED FOR CLARITY.

NOTES

FIGURE 3.4.5 MODELS 390-AMX AND 3120-AMX CHASSIS INTERCONNECTIONS

3.4.5 MODELS 390 and 3120-AMX CHASSIS INTERCONNECTIONS

This paragraph describes the wiring requirements for connecting the two chassis of the Models 390 and 3120-AMX Power Sources. Figure 3.4.5 shows the connections required between the two chassis.

*** * * WARNING * * ***

- LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !
- REFER OUTPUT CONNECTION TO A QUALIFIED ELECTRICIAN.

*** * * WARNING * * ***

Connection of the two chassis is as follows:

1) The Paralleling Interconnect cable, supplied with the system, is connected to the MS connectors, labeled J11, located on the rear panel of each chassis.
2) The DB-25 to DB-25 cable, supplied with the system, is connected to the DB-25 connectors, labeled J3C, located near J11 on each power source chassis.
   (Note that both of these cable assemblies are wired one-for-one and cannot be installed backwards.)
3) Connect the output terminals of both chassis to each other. That is, connect the ϕA terminal of the Master to the ϕA terminal of the Slave, and so forth.
4) If present, connect each Magnetics Module to its Power Source in the standard fashion (refer to paragraph 3.2.7 for detailed instructions.)

For the Model 3120-AMX, verify that the two chassis to be connected together have identical chassis part numbers (located on the System Identification label). Connection of two chassis with dissimilar chassis part numbers will result in operation of the "Master" chassis only. This applies only when attempting to connect chassis that were not originally shipped together from the factory as a complete system.

The "Master" chassis is that which has the UMC-31 or UPC-32 controller installed.

Output power connection is made to the Master chassis only at the terminal block labeled "**OUTPUT POWER**" located on its rear panel (refer to paragraphs 3.4.1 through 3.4.4 for detailed instructions). External sense connection is made in the standard fashion (refer to paragraph 3.7 for detailed instructions) with the exception that connection is made only to the Master Power Source chassis. The Remote Interface (GPIB or RS-232) and AUX I/O connectors are also located on the rear panel of the Master chassis.

The "**CHS**" terminal of both chassis ***must always*** be connected together.
The "**N**" terminal of the Output Power Terminal Block of both chassis ***must always*** be connected together.

Refer to paragraphs 4.3.1 and 4.4.1 for notes regarding Power-Up and Turn-Off of the Models 390 and 3120-AMX Power Sources.

NOTE: It is the user's responsibility to meet all local and national electrical codes when installing this equipment.

3.5 REMOTE INTERFACE

The programmable controller (UPC-Series Controller) is supplied with one of two remote interfaces. These are the GPIB (General Purpose Interface Bus) or RS-232 Interface. Connection information relative to these interfaces is described in detail in the *UPC-Series Operation* manual.

Systems which contain the UMC-31 controller do not have Remote interface capability. Therefore, this paragraph does not apply to such systems.

3.6 AUX I/O INSTALLATION

This paragraph describes connection of the **AUX**iliary **I**nput/**O**utput signals. These signals vary between the different controllers. However, the method of connection remains the same.

The AUX I/O connector contains synchronizing outputs (digital) and modulation inputs (analog). These are extremely useful in certain test applications, particularly, single event phenomena. Modulation inputs are also present on this connector. The use of any of these signals is optional and connection to these points is required only when these features are used.

The AUX I/O connector is located on the rear panel of the power source and is labeled as such. This is a DB-25S connector. A DB-25P connector is required for connection to AUX I/O connector.

All signals contained within the AUX I/O connector are low-level (less than ± 15 VDC) and are with respect to earth ground reference. Refer to the appropriate controller operation manual for complete definition of the signals present on the AUX I/O connector. For UMC-31 equipped systems, refer to Section 8 of this manual.

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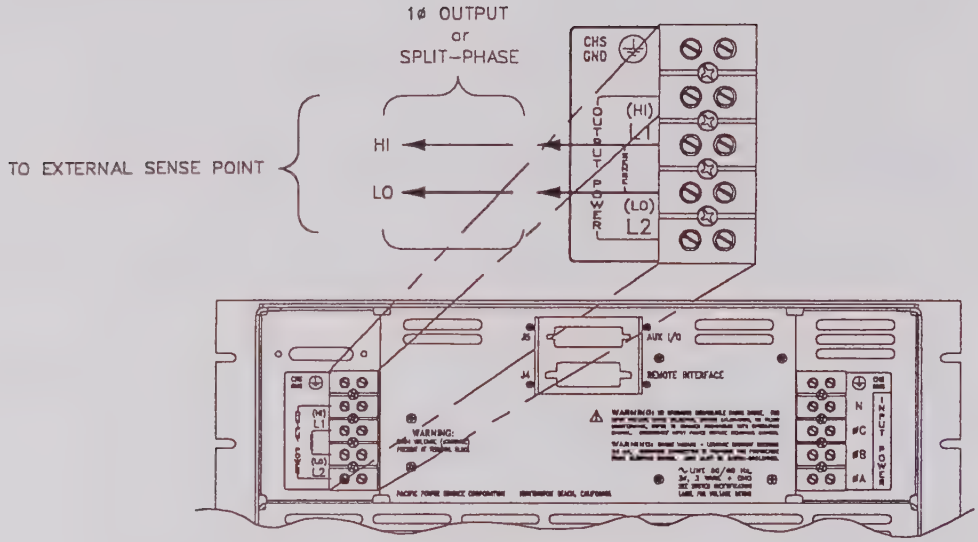
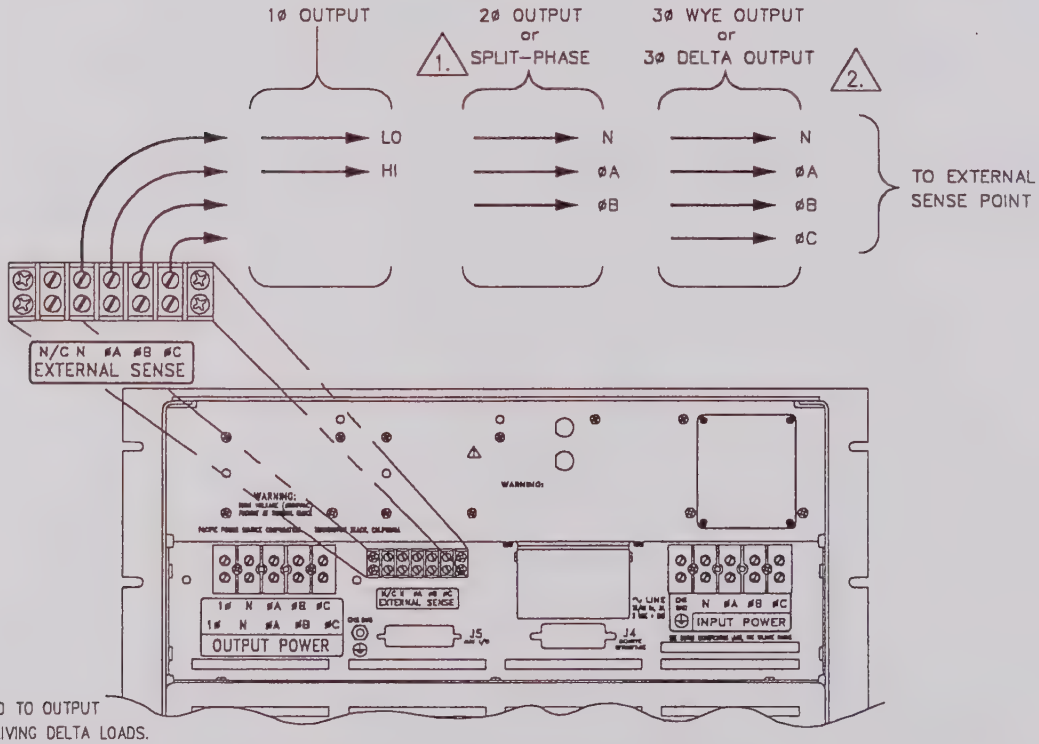


MODEL 125-AMX
REAR VIEW

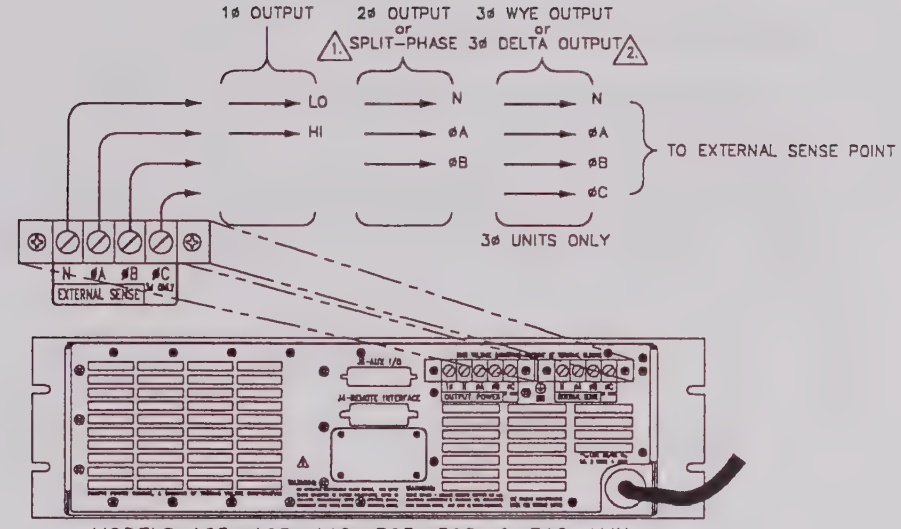


MODELS 140, 345, 360, 390, & 3120-AMX
REAR VIEW

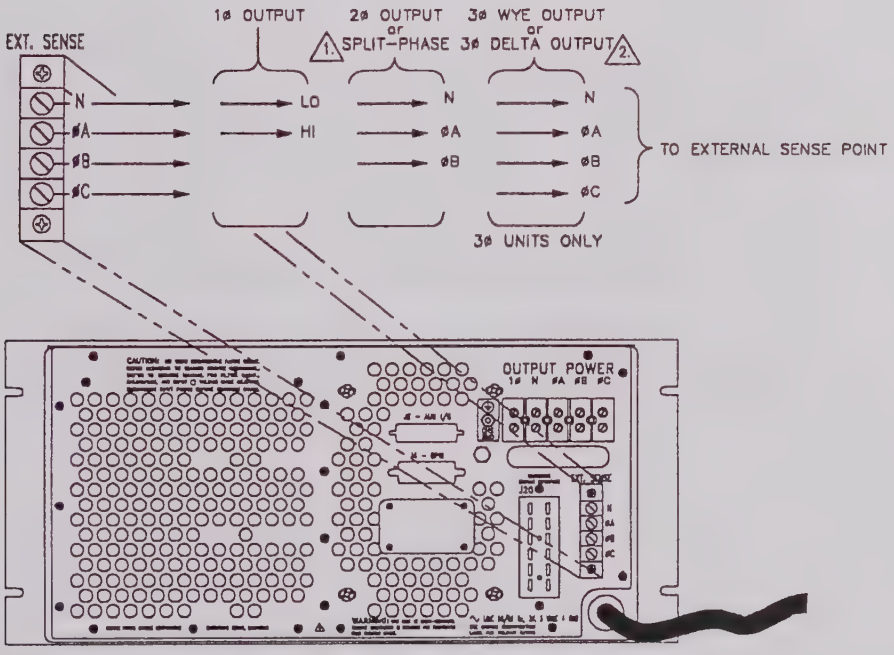
NOTES

2. NEUTRAL WIRE TIED TO OUTPUT NEUTRAL WHEN DRIVING DELTA LOADS.
1. NEUTRAL WIRE TIED TO OUTPUT NEUTRAL WHEN DRIVING 220 VAC DIRECT-COUPLED LOADS.

FIGURE 3.8.1 EXTERNAL SENSE CONNECTION, MODELS 125, 140, 345, 360, 390, AND 3120-AMX



MODELS 105, 108, 112, 305, 308, & 312-AMX
REAR VIEW



MODEL 320-AMX
REAR VIEW

2. NEUTRAL WIRE TIED TO OUTPUT NEUTRAL WHEN DRIVING DELTA LOADS.
1. NEUTRAL WIRE TIED TO OUTPUT NEUTRAL WHEN DRIVING 220 VAC DIRECT-COUPLED LOADS.

NOTES

FIGURE 3.8.2 EXTERNAL SENSE CONNECTION, MODELS 105, 108, 112, 305, 308, 312, AND 320-AMX

3.7 EXTERNAL SENSE CONNECTION

This paragraph describes connection of external sense leads to the AMX-Series Power Source. External Sense wire size and methods are discussed.

The AMX-Series Power Source contains External Sense Circuits. These circuits measure output voltage at a external sense point. Since this feature can be completely disabled, the wiring detailed in this paragraph is optional. If the External Sense feature is desired, this paragraph describes the wiring requirements for the function.

*** * * WARNING * * ***

- LETHAL VOLTAGES ARE PRESENT AT THE External SENSE TERMINALS OF THIS MACHINE !
- REFER CONNECTION TO A QUALIFIED ELECTRICIAN.

*** * * WARNING * * ***

Figures 3.8.1 and 3.8.2 show external sense wiring for 1, 2, and 3ϕ systems. There is little or no current flowing through the External Sense Feedback lines. Standard 22 AWG, 600 Volt control wire is recommended for this application. Twisting the External Sense wiring is recommended and, in some cases, can improve performance. In noisy environments, shielding may become necessary to improve performance. If shielded cable is used, be sure to ground the shield at one end only to prevent the possibility of creating a ground loop.

When wiring the External Sense Leads to a DELTA load (refer to paragraph 3.4.3), connect the Neutral terminal of the External Sense Terminal block to the Neutral terminal of the Output Terminal block.

When the neutral wire is not used by the load on a split phase output (2 Phase Output Mode, refer to paragraph 3.4.2), connect the Neutral terminal of the External Sense Terminal block to the Neutral terminal of the Output Power Terminal block. In cases where the load has a neutral terminal, connect the neutral lead from External Sense Terminal block to the neutral terminal of the load.

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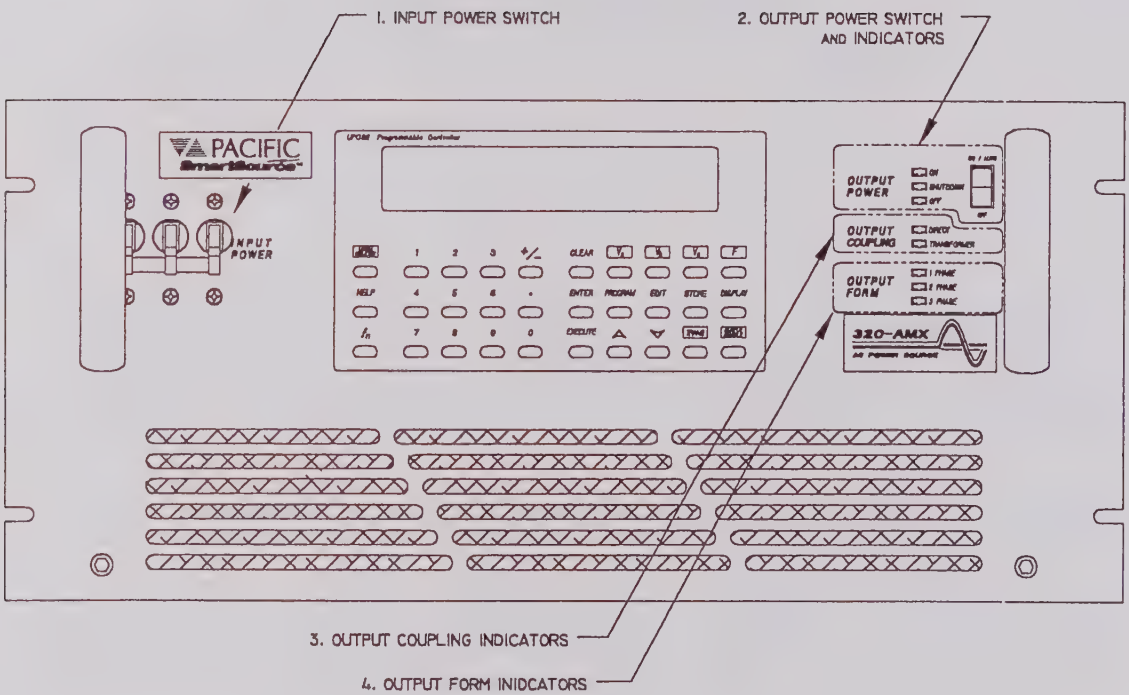

MODEL 320-AMX
W/ UPC-32 CONTROLLER

FIGURE 4.1 FRONT PANEL CONTROLS

SECTION 4

OPERATION

4.0 OPERATION

This section describes the operation of an AMX-Series AC Power Source. The procedure described in the following paragraphs is a general procedure common to all systems (except as noted). This procedure does not detail operation of a specific controller. Refer to the appropriate controller manual for detailed information regarding the installed controller.

4.1 FRONT PANEL CONTROLS

This paragraph shows the location of the front panel controls and indicators of the AMX-Series Power Source. A brief description of each is also given. Figure 4.1 is a front view of the Model 308-AMX with a UPC-32 controller installed. The front panel control section is similar in all AMX-Series models. Refer to the *UPC-Series OPERATION MANUAL* or Section 8 of this manual for information relative to the installed controller.

1. INPUT POWER SWITCH (Circuit Breaker)

Circuit Breaker used as the main input ON/OFF control and protects the power source from drawing excessive input current from the input AC line.

2. OUTPUT POWER SWITCH and INDICATORS

Switch used to control the output contactor of the AMX-Series Power Source. Indicators show the state of the output contactor. The power source will enter shutdown for the case of over-temperature or other internal fault. Shutdown is reset when the Output Power Switch is set to OFF and the fault has cleared. Refer to Paragraph 4.5 for details.

3. OUTPUT COUPLING INDICATORS

LED's which show the Output Coupling of the power source.

4. OUTPUT FORM INDICATORS

LED's which show the Output Form that is active. (The 3 Phase indicator is not present on the Models 105, 108, 112, 125, and 140-AMX.)

4.2 INITIAL POWER-UP

This paragraph describes the procedure used to turn on the AMX-Series Power Source for the first time. The steps below are the recommended order of operation.

* * * **WARNING** * * *

- **LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !**

* * * **WARNING** * * *

1. For new installations, check input connections (including proper input voltage). Do not connect the load at this time. Also verify that the OUTPUT POWER switch is in the **OFF** position.

2. Switch the INPUT POWER switch to the **ON** position. The controller will light up and begin to display output data.

3. Set the controller for the desired output voltage, frequency, phase separation, etc. (Refer to the appropriate controller operation manual for details regarding adjustment of output parameters.)

4. Set the OUTPUT POWER switch to the **ON/AUTO** position. Systems equipped with the UPC also require the OUTPUT ENABLE to be **ON**.

--- **CAUTION** ---

- **DO NOT CONNECT ANY LOADS TO THE OUTPUT OF THE POWER SOURCE UNTIL THE OUTPUT VOLTAGE AND FREQUENCY HAVE BEEN VERIFIED AS CORRECT.**

- **APPLICATION OF IMPROPER VOLTAGE OR FREQUENCY CAN DAMAGE USER LOADS.**

--- **CAUTION** ---

5. Verify proper voltage, frequency and waveform at the output terminal block. If the output is not that which is desired, set the output to desired values. Refer to the controller manual for details.

6. Once the desired output is verified, turn the system OFF by first setting the OUTPUT POWER SWITCH to the **OFF** position and then opening the INPUT POWER SWITCH. Connect the load.

7. Re-start the unit beginning at step 2, above. Verify that the system delivers power to the load.

4.3 ROUTINE POWER-UP

This paragraph describes the procedure used to turn on the AMX-Series Power Source after if has been verified that the installation is correct. The steps below are the recommended order of operation.

* * * WARNING * * *

- **LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !**

* * * WARNING * * *

1. Set the OUTPUT POWER switch to the **OFF** position.
   Switch the INPUT POWER switch to the **ON** position. The controller will light up and begin to display output data. The value of the output parameters will be set for the same values as when the unit was last turned off.

2. Set the OUTPUT POWER switch to the **ON/AUTO** position. Systems equipped with the UPC also require the OUTPUT ENABLE to be **ON**.

--- CAUTION ---

- **DO NOT CLOSE THE OUTPUT CONTACTOR OF THE POWER SOURCE UNTIL THE OUTPUT VOLTAGE AND FREQUENCY HAVE BEEN MEASURED AND VERIFIED AS CORRECT.**

- **APPLICATION OF IMPROPER VOLTAGE OR FREQUENCY CAN DAMAGE USER LOADS.**

--- CAUTION ---

4.3.1 ROUTINE POWER-UP, MODELS 390 and 3120-AMX

This paragraph describes the procedure used to turn on the Models 390 and 3120-AMX Power Sources after if has been verified that the installation is correct. The steps below are the recommended order of operation.

* * * WARNING * * *

- **LETHAL VOLTAGES ARE PRESENT AT THE OUTPUT TERMINALS OF THIS MACHINE !**

* * * WARNING * * *

4.3.1 ROUTINE POWER-UP, MODELS 390 and 3120-AMX(cont.)

1. Set the OUTPUT POWER switch of the Master Chassis (that which has the controller installed) to the **OFF** position. The Output Power Switch of the Slave chassis is disabled. Switch the INPUT POWER switch of the Master chassis to the **ON** position. Switch the INPUT POWER switch of the Slave chassis to the **ON** position. This sequence is recommended so that the power amplifiers of the system operate in a controlled manner during power-up. The controller will light up and begin to display output data. The value of the output parameters will be set for the same values as when the unit was last turned off.

2. Set the OUTPUT POWER switch of the Master chassis to the **ON/AUTO** position. Systems equipped with the UPC also require the OUTPUT ENABLE to be **ON**.

--- CAUTION ---

- **DO NOT CLOSE THE OUTPUT CONTACTOR OF THE POWER SOURCE UNTIL THE OUTPUT VOLTAGE AND FREQUENCY HAVE BEEN MEASURED AND VERIFIED AS CORRECT.**

- **APPLICATION OF IMPROPER VOLTAGE OR FREQUENCY CAN DAMAGE USER LOADS.**

--- CAUTION ---

4.4 SYSTEM TURN-OFF

This paragraph describes the procedure used to turn off the AMX-Series Power Source.

The AMX-Series Power Source is turned off by:

1. Setting the OUTPUT POWER Switch to the **OFF** position.

2. Opening the INPUT POWER circuit breaker.

4.4.1 SYSTEM TURN-OFF, MODELS 390 and 3120-AMX

This paragraph describes the procedure used to turn off the 390 and 3120-AMX Power Sources.

The 390 and 3120-AMX Power Sources are turned off by:

1. Setting the OUTPUT POWER Switch of the Master chassis (that which has the controller installed) to the **OFF** position.

2. Opening the INPUT POWER circuit breaker of the Slave chassis.

3. Opening the INPUT POWER circuit breaker of the Master chassis.

--- CAUTION ---

It is recommended that only the OUTPUT POWER switch of the Master chassis be used to remove power to a load. The INPUT POWER switch of the Slave chassis should never be turned to the **OFF** position with a load attached to the system as it will subject the Master chassis to all the load current being delivered by the system. This will cause an overtemp shutdown if the load exceeds the Master chassis' system ratings. Also, the Master chassis INPUT POWER switch should never be used to remove power to a load since it drives all the control circuits for the paralleled system.

--- CAUTION ---

4.5 SYSTEM SHUTDOWN

This paragraph describes the conditions which will cause system shutdown and the procedure used to reset the AMX-Series Power Source.

4.5.1 SHUTDOWN CONDITIONS

The Output Contactor of the AMX-Series Power Source will be opened automatically when:

1. Either the Input Power Transformer or one of the power amplifier PCB's has reached an Over-temperature condition. (Over-temperature is usually caused by either blocking the air inlets (includes dirty fan filters) or overloading the power source.)

2. The state of the Output Coupling has changed while the Output Contactor is engaged.

3. The state of the Output Form has changed while the Output Contactor is engaged.

When the Output Contactor has been opened due to one of the above faults, the SHUTDOWN LED on the front panel of the power source will be lighted. The output contactor will remain open while the SHUTDOWN LED is lighted. This LED will remain lighted until reset.
If the Output Power Switch is in the **ON/AUTO** position when the unit is turned on, the SHUTDOWN LED will light. This is normal operation. The LED is turned off simply by placing the Output Power Switch into the **OFF** position.

4.5.2 RESETTING SHUTDOWN FAULTS

The shutdown fault is reset as follows:

1. Set the OUTPUT POWER Switch to the **OFF** position.

2. Wait for the SHUTDOWN LED to extinguish. This LED will remain lighted until the condition which caused the shutdown to occur has been corrected. In the case of shutdown due to over-temperature this may take some time. The output contactor cannot be engaged until the shutdown fault has been cleared.

NOTE: The SHUTDOWN LED is latched on when a fault occurs. The OUTPUT POWER Switch or the Output Enable of the UPC *MUST* be placed in the **OFF** position before the SHUTDOWN LED will extinguish, even if the original fault no longer exists.

3. After the SHUTDOWN LED has been extinguished, the unit will function normally.

4.6 OUTPUT VOLTAGE FORMS

This paragraph describes the various output voltage forms for which the AMX-Series Power Source can be configured.

A recommended strategy for selecting the optimum output voltage form is based two basic philosophies. The first is to use a direct-coupled output form whenever possible. The second is to select the minimum voltage range necessary to drive the load.

Direct-coupled output is preferred because the output impedance is extremely low. A second reason to use the direct-coupled output form is that low frequency limitations associated with transformer outputs do not exist. This is especially true when attempting to perform sub-cycle transients.

Selecting the minimum voltage range necessary to drive the load allows the power source to operate more efficiently. This results in less heat being dissipated into the surrounding environment.

Paragraph 4.6.1 discusses the various structures associated with the different output forms.

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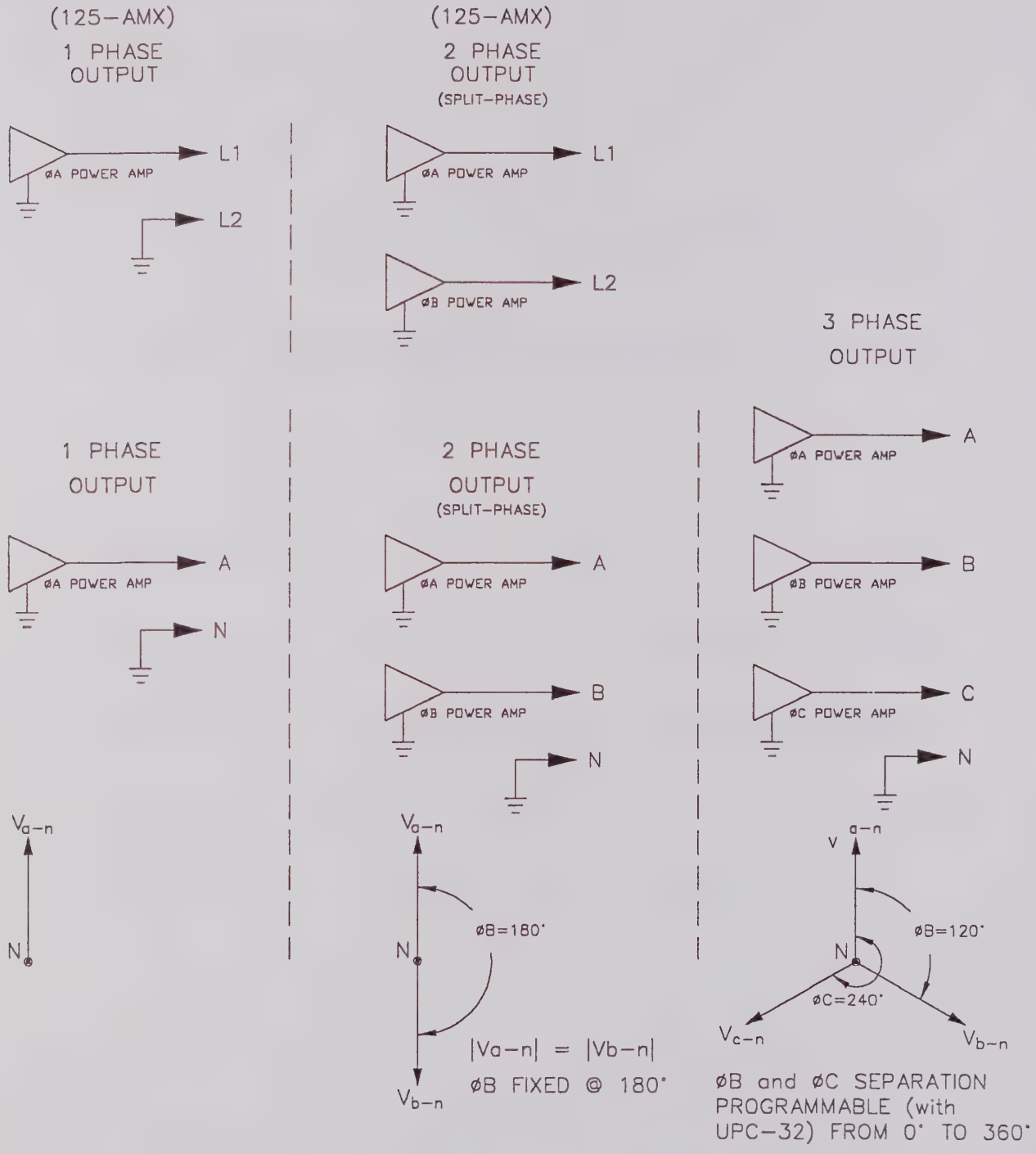

FIGURE 4.6.1 AMX-SERIES SYSTEM ARCHITECTURE

4.6.1 SYSTEM ARCHITECTURE

The AMX-Series Power Source output can be configured for single, split, and three phase voltage forms. Figure 4.6.1 is a simplified block diagram of the possible output architectures. Only the direct-coupled output forms are shown. All of the forms can be supplied with transformers to raise the output voltage level.

The **1 PHASE** mode of operation is a one vector output form. All of the power amplifier PCB's are connected in parallel to form one output vector. The standard, direct-coupled version of this output form is capable of 0-135 $VAC_{l\text{-}n}$ (0-150 $VAC_{l\text{-}n}$ for the Models 112, 312, and 125-AMX). The voltage ranges of the various transformer output forms are: VR1.5 - 0 to 204 $VAC_{l\text{-}n}$ (Models 105, 108, 140, 305, 308, 345, 360, 390, and 3120-AMX), VR2.0 - 0 to 273 $VAC_{l\text{-}n}$ (Models 105, 108, 140, 305, 308, 345, 360, 390, and 3120-AMX), and VR2.5 - 0 to 341 $VAC_{l\text{-}n}$ (Models 105, 108, 140, 305, 308, 360, 390, and 3120-AMX).

The **2 PHASE** mode of operation is a two vector output form where the vectors are separated by 180° and equal in amplitude. This output form uses power amplifiers in pairs, one for each vector. The load can be attached from either line to neutral, line to line, or a combination of both (line to line only in the case of the Model 125-AMX). The standard, direct-coupled version of this output form has a voltage range of 0-270 $VAC_{l\text{-}l}$ (0-300 $VAC_{l\text{-}l}$ for the Models 112, 312, and 125-AMX). The voltage ranges of the various transformer output forms are: VR1.5 - 0 to 408 $VAC_{l\text{-}l}$ (Models 105, 108, 140, 305, 308, 345, 360, 390, and 3120-AMX), VR2.0 - 0 to 546 $VAC_{l\text{-}l}$ (Models 105, 108, 140, 305, 308, 345, 360, 390, and 3120-AMX), and VR2.5 - 0 to 600 $VAC_{l\text{-}l}$ (Models 105, 108, 140, 305, 308, 345, 360, 390, and 3120-AMX). Note that in the case of the Models 305, 308, 330, 345, 360, 390, and 3120-AMX, only two of the three power amplifiers are connected--limiting these systems to producing only two-thirds of rated output power.

NOTE: The AMX-Series Power Sources do not support voltages in excess of 600 VAC_{rms} due to controller, safety, and spacing limitations. Attempting to defeat the inherent programming limitations of the controller to obtain higher voltages is ***strongly*** recommended against.

The **3 PHASE** mode of operation is a three vector output form with vectors normally separated by 120°. Power amplifiers are supplied in groups of three with this output form and are WYE connected. A WYE load is connected across the A, B, C, and Neutral terminals of the output terminal block. This output form will also drive DELTA loads. DELTA loads are simply connected across the A, B, and C terminals of the output terminal block with the Neutral terminal not connected. The standard, direct-coupled version of this form has an output voltage range of 0 to 135/234 VAC (0 to 150/260 VAC for the Model 312-AMX). The voltage ranges of the various transformer output forms are: VR1.5 - 0 to 204/353 VAC (Models 305, 308, 345, 360, 390, and 3120-AMX), VR2.0 - 0 to 273/473 VAC (Models 305, 308, 345, 360, 390, and 3120-AMX), and VR2.5 - 0 to 341/591 VAC (Models 305, 308, 345, 360, 390, and 3120-AMX).

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SECTION 5

MAINTENANCE

5.0 MAINTENANCE

This section describes the maintenance of the AMX-Series AC Power Source.

5.1 MAINTENANCE INTERVAL

Maintenance of the Models 105-AMX, 108-AMX, 112-AMX, 305-AMX, 308-AMX, and 312-AMX Power Sources is required once every six months and consists of performing regular calibration.

Maintenance of the Models 125-AMX, 140-AMX, 320-AMX, 345-AMX, 360-AMX, 390-AMX, and 3120-AMX Power Sources is required once every three months and consists of checking/cleaning the fan filter, with regular calibration once every six months.

5.2 MAINTENANCE REQUIREMENTS

5.2.1 MODELS 105, 108, 112, 305, 308, & 312-AMX

The Models 105-AMX, 108-AMX, 112-AMX, 305-AMX, 308-AMX, and 312-AMX require calibration once every six months as regular maintenance. Refer to Section 6 for details.

5.2.2 MODELS 125, 140, 320, 345, 360, 390, & 3120-AMX

The Models 125, 140, 320, 345, 360, 390, and 3120-AMX require maintenance once every three months. Maintenance of these models consists of verifying that the fan filter is clean. It is important that this filter is kept clean in order to insure proper cooling of internal components.

The fan filter is cleaned as follows:

1. Slide the chassis forward to reveal the fan filter access panel, located on the bottom of the chassis.
2. Remove the fan filter access panel. (The 320-AMX has no access panel. Loosen the 2 screws that partially protrude from the side panels, directly above the filter, to allow the filter to slide out of its holder.)
3. The filter will slide out of its holder. Remove the filter.
4. Wash and dry the fan filter. The filter is a metal screen mesh type. It is reusable and is best cleaned by washing with warm soapy water. Make sure that the filter is dry before installing it into the chassis.
5. Install the filter and then replace the fan filter access plate (if so equipped).
6. Slide the chassis back into its normal position.

If system operation is suspect or the calibration interval has passed, perform the calibration procedure outlined in Section 6.

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SECTION 6

CALIBRATION

6.0 CALIBRATION

This section describes the calibration of the AMX-Series AC Power Source.

6.1 CALIBRATION INTERVAL

The AMX-Series Power Source requires calibration once every six months or after service has been performed to the system.

6.2 TEST EQUIPMENT REQUIREMENTS

The test equipment listed below is required for calibration of the AMX-Series Power Source.

1. Digital Voltmeter: 4½ Digit True-RMS responding
   5000 Hz bandwidth, min.

2. Frequency counter: 5 digit counter, min.

3. Digital Ammeter: 3½ Digit True-RMS responding
   5000 Hz bandwidth, min.
   (Alternate Approach: Current transformer used in conjunction with the DVM.)

4. Oscilloscope: (Optional)

5. Load: Varies by model number;

   2A @ 125 VAC, Model 305, 308-AMX
   2.6A @ 150 VAC, Model 312-AMX
   3A @ 125 VAC, Model 105, 108-AMX
   4A @ 150 VAC, Model 112-AMX
   6A @ 125 VAC, Model 320-AMX
   10A @ 125 VAC, Model 125-AMX
   12A @ 125 VAC, Model 345-AMX
   16A @ 125 VAC, Model 140-AMX
   16A @ 125 VAC, Model 360-AMX
   24A @ 125 VAC, Model 390-AMX
   32A @ 125 VAC, Model 3120-AMX

6.3 CALIBRATION PROCEDURE

The calibration procedure which follows verifies that system gains are set properly and that the system performance, relative to output power capability, is intact. Gains in various signal paths within the controller are adjusted by the procedure of Paragraph 6.3.1. Output power capability of the power source is tested by the procedure of Paragraph 6.3.2. The procedure is written for three phase systems. When calibrating single phase systems, ignore all instructions relating to phases B and C.

*** * * WARNING * * ***

- OBSERVE THE FOLLOWING WHEN CALIBRATION IS PERFORMED:

  1) REMOVE ALL JEWELRY FROM ARMS AND NECK WHEN SERVICING THIS EQUIPMENT. THIS PREVENTS THE POSSIBILITY OF SHORTING THROUGH THE JEWELRY AND CAUSING BURNS TO OR ELECTROCUTION OF THE OPERATOR.

  2) **WEAR SAFETY GLASSES** WHEN SERVICING THIS EQUIPMENT TO PREVENT EYE INJURY DUE TO FLYING PARTICLES CAUSED BY ACCIDENTAL SHORT CIRCUIT CONDITIONS.

  3) DO NOT REMOVE ANY PANELS OR COVERS WITHOUT FIRST OPENING **ALL** CIRCUIT BREAKERS AND THEN REMOVING THE INPUT SERVICE.

  4) SERVICE OTHER THAN CLEANING FILTERS AND CALIBRATION SHOULD BE REFERRED TO PERSONNEL AUTHORIZED BY THE FACTORY TO SERVICE THIS EQUIPMENT.

*** * * WARNING * * ***

6.3.1 CALIBRATE CONTROLLER

The first step in system calibration is to calibrate the controller. The controller calibration procedure is unique to the installed controller. Calibrate the controller as stated in the appropriate controller manual.

UPC Controller - Refer to Section 8 of the *UPC-Series Operation Manual*.

UMC Controller - Refer to Section 8 of this manual.

6.3.2 POWER SOURCE LOAD TEST

This paragraph describes the test to be used to verify that the power source is able to deliver rated load. Additionally, the output metering function of the controller is also checked.

The test proceeds in the manner below.

1. Set the power source for 3ϕ Output (2ϕ for models 105, 108, 112, 125, and 140-AMX), Direct-coupled, CSC Enabled.

2. Attach a full-rated load to the ϕA output terminal. (Refer to the list in paragraph 6.2 for the proper load.)

3. Set the output for full-rated voltage and close the Output contactor.

4. Verify that the output voltage remains constant (within load regulation limits) and that the output metering reads correct values.

5. Open the Output Contactor.

6. Repeat for ϕB and ϕC (ϕC for 3ϕ systems only) outputs.

7. Configure for 1ϕ output and repeat above procedure.

8. If system is outfitted with transformer outputs, set the power source for 3ϕ Output (2ϕ for models 105, 108, and 140-AMX), Transformer-coupled, CSC or Current Compensation Enabled.

9. Verify that the output voltage and power source meters read properly.

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6.3.2 POWER SOURCE LOAD TEST

This paragraph describes the test to be used to verify that the power source is able to deliver rated load. Additionally, the output metering function of the controller is also checked.

The test proceeds in the manner below.

1. Set the power source for 3ϕ Output (2ϕ for models 105, 108, 112, 125, and 140-AMX), Direct-coupled, CSC Enabled.

2. Attach a full-rated load to the ϕA output terminal. (Refer to the list in paragraph 6.2 for the proper load.)

3. Set the output for full-rated voltage and close the Output contactor.

4. Verify that the output voltage remains constant (within load regulation limits) and that the output metering reads correct values.

5. Open the Output Contactor.

6. Repeat for ϕB and ϕC (ϕC for 3ϕ systems only) outputs.

7. Configure for 1ϕ output and repeat above procedure.

8. If system is outfitted with transformer outputs, set the power source for 3ϕ Output (2ϕ for models 105, 108, and 140-AMX), Transformer-coupled, CSC or Current Compensation Enabled.

9. Verify that the output voltage and power source meters read properly.

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SECTION 7

SERVICE

7.0 SERVICE

This section describes service of the AMX-Series AC Power Source.

7.1 SERVICE PROCEDURE

The AMX-Series Power Source contains no user serviceable parts. Service is accomplished by returning the unit to the factory. Under some circumstances, the factory *may* authorize the user to perform limited sub-assembly or component changes as deemed allowable by the factory service representative. For this purpose, many sub-assembly and component level Pacific Power Source part numbers have been included here. Part numbers for various components are listed separately for each Model.

When questions regarding operation arise or service is required, call the factory for instructions. Pacific Power Source maintains a staff of highly trained technicians who are ready to assist. The phone number to call is (714)898-2691.

7.2 ROSTER OF SYSTEM LEVEL FACTORY PART NUMBERS

The following is a list of system level factory part numbers for the models which comprise the AMX-Series line of equipment. Part numbers are stated for reference.

ASSEMBLY NAME		ASSEMBLY NUMBER
MODEL 105-AMX	500 VA AC Power Source	143141
MODEL 108-AMX	750 VA AC Power Source	143142
MODEL 112-AMX	1.2 kVA AC Power Source	143146
MODEL 125-AMX	2.5 kVA AC Power Source	143125
MODEL 140-AMX	4.5 kVA AC Power Source	143140
MODEL 305-AMX	500 VA AC Power Source	143143
MODEL 308-AMX	750 VA AC Power Source	143144
MODEL 312-AMX	1.2 kVA AC Power Source	143147
MODEL 320-AMX	2.25 kVA AC Power Source	143108
MODEL 330-AMX	3.0 kVA AC Power Source	143109
MODEL 345-AMX	4.5 kVA AC Power Source	143126
MODEL 360-AMX	6.0 kVA AC Power Source	143127
MODEL 390-AMX	9.0 kVA AC Power Source	143128
MODEL 3120-AMX	12.0 kVA AC Power Source	143129
Transformer assembly for the 105, 108, 305, 308-AMX		139410
Magnetics Module for the 140, 345, 360, 390, 3120-AMX		134310

7.2 ROSTER OF SYSTEM LEVEL FACTORY PART NUMBERS (cont.)

ASSEMBLY NAME	ASSEMBLY NUMBER
UPC12 Programmable 1ϕ Controller	133700
UPC32 Programmable 3ϕ Controller	133600
UMC31 Manual 3ϕ Controller	133500

7.3 SUB-ASSEMBLY AND CHASSIS COMPONENT PART NUMBERS

The factory part numbers given in the following sections are provided to aid the user in obtaining spare or repair sub-assemblies and components where the factory has given permission, in advance, for the user to perform field repairs on the AMX-Series Power Source.

7.3.1 FACTORY PART NUMBERS, MODEL 105-AMX

SUB-ASSEMBLY	FACTORY PART No.
Power Amplifier PCB:	139070
LED Display PCB:	139071
Output Filter PCB:	139073
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Control/Logic PCB:	139078
Input Filter PCB:	140079

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716061
Front Panel Handle:	702112
Output Terminal Block:	705077
External Sense Terminal Block:	705076
Input Power Cord Strain Relief:	779009
Input Transformer:	531317
Input Power Supply Bridge Rectifier:	743005
Input Power Supply High Voltage DC Capacitor:	720588-43
Output Relay:	717040
Power Amplifier Fan:	702145

7.3.2 FACTORY PART NUMBERS, MODEL 108-AMX

SUB-ASSEMBLY	FACTORY PART No.
Power Amplifier PCB:	139070
LED Display PCB:	139071
Output Filter PCB:	139073
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Control/Logic PCB:	139078
Input Filter PCB:	140079

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716061
Front Panel Handle:	702112
Output Terminal Block:	705077
External Sense Terminal Block:	705076
Input Power Cord Strain Relief:	779009
Input Transformer:	531317
Input Power Supply Bridge Rectifier:	743005
Input Power Supply High Voltage DC Capacitor:	720588-43
Output Relay:	717040
Power Amplifier Fan:	702145

7.3.3 FACTORY PART NUMBERS, MODEL 112-AMX

SUB-ASSEMBLY	FACTORY PART No.
Power Amplifier PCB:	139070
LED Display PCB:	139071
Output Filter PCB:	139073
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Power Factor Correction PCB:	139075
Control/Logic PCB:	139078
Input Filter PCB:	140079

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716061
Front Panel Handle:	702112
Output Terminal Block:	705077
External Sense Terminal Block:	705076
Input Power Cord Strain Relief:	779009
Input Transformer (T1):	531318
Low Voltage Input Transformer (T2):	531290
Output Relay:	717040
Power Amplifier Fan:	702145
Input Transformer Fan:	702136

7.3.4 FACTORY PART NUMBERS, MODEL 125-AMX

SUB-ASSEMBLY	FACTORY PART No.
Control/Metering PCB:	134170
Voltage Amplifier PCB:	134671
LED Display PCB:	139071
Power Amplifier PCB:	139670
Input Filter PCB:	140078
Output Filter PCB:	143372

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716059
Front Panel Handle:	702112
Trunk Handle:	702128
Input Terminal Block:	705009
Output Terminal Block:	705009
Input Transformer:	531304
Input Power Supply Bridge Rectifier:	743005
Input Power Supply High Voltage DC Capacitor:	720588-43
Output Relay:	717043
Power Amplifier Fan:	702136

7.3.5 FACTORY PART NUMBERS, MODEL 140-AMX

SUB-ASSEMBLY	FACTORY PART No.
Control/Metering PCB:	134170
Input Filter PCB:	134175
Input Filter PCB:	134177
External Sense Filter PCB:	134178
Output Filter PCB:	134179
Power Amplifier PCB:	134477
Voltage Amplifier PCB:	134671
LED Display PCB:	139071

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716053
Front Panel Handle:	702113
Trunk Handle:	702128
Input Terminal Block:	705009
Output Terminal Block:	705009
External Sense Terminal Block:	705067
Magnetics Module Bypass-Conn. Housing (J20):	714068
Panel-Mount Magnetics Module Connector (P20):	714185
Input Transformer:	531322
Input Power Supply Bridge Rectifier:	743001
Input Power Supply High Voltage DC Capacitor:	720219-10
Output Contactor:	717043
Power Amplifier Fan:	702139
Input Transformer Fan:	702136

7.3.6 FACTORY PART NUMBERS, MODEL 305-AMX

SUB-ASSEMBLY	FACTORY PART No.
LED Display PCB:	139071
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Output Filter PCB:	139073
Power Amplifier PCB:	139077
Control/Logic PCB:	139078
Input Filter PCB:	140079

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716061
Front Panel Handle:	702112
Output Terminal Block:	705077
External Sense Terminal Block:	705076
Input Power Cord Strain Relief:	779009
Input Transformer (T1):	531317
Input Power Supply Bridge Rectifier:	743005
Input Power Supply High Voltage DC Capacitor:	720588-43
Output Relay:	717040
Power Amplifier Fan:	702145

7.3.7 FACTORY PART NUMBERS, MODEL 308-AMX

SUB-ASSEMBLY	FACTORY PART No.
LED Display PCB:	139071
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Output Filter PCB:	139073
Power Amplifier PCB:	139077
Control/Logic PCB:	139078
Input Filter PCB:	140079

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716061
Front Panel Handle:	702112
Output Terminal Block:	705077
External Sense Terminal Block:	705076
Input Power Cord Strain Relief:	779009
Input Transformer (T1):	531317
Input Power Supply Bridge Rectifier:	743005
Input Power Supply High Voltage DC Capacitor:	720588-43
Output Relay:	717040
Power Amplifier Fan:	702145

7.3.8 FACTORY PART NUMBERS, MODEL 312-AMX

SUB-ASSEMBLY	FACTORY PART No.
LED Display PCB:	139071
Output Filter PCB:	139073
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Power Factor Correction PCB:	139075
Power Amplifier PCB:	139077
Control/Logic PCB:	139078
Input Filter PCB:	140079

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716061
Front Panel Handle:	702112
Output Terminal Block:	705077
External Sense Terminal Block:	705076
Input Power Cord Strain Relief:	779009
Input Transformer (T1):	531318
Low Voltage Input Transformer (T2):	531290
Output Relay:	717040
Power Amplifier Fan:	702145
Input Transformer Fan:	702136

7.3.9 FACTORY PART NUMBERS, MODEL 320-AMX

SUB-ASSEMBLY	FACTORY PART No.
Power Amplifier PCB:	139070
LED Display PCB:	139071
Low Voltage Power Supply/Fan Speed Cont. PCB:	139074
Control/Logic PCB:	139078
Auxiliary PCB:	140073

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716059
Front Panel Handle:	702112
Trunk Handle:	702130
Output Terminal Block:	705009
External Sense Terminal Block:	705076
Magnetics Module Bypass-Conn. Housing (J20):	714068
Panel-Mount Magnetics Module Connector (P20):	714185
Input Power Cord Strain Relief:	779009
Input Transformer:	531302
Input Power Supply Bridge Rectifier:	743011
Input Power Supply High Voltage DC Capacitor:	720588-43
Output Contactor:	717038
Power Amplifier Fan:	702139
Input Transformer Fan:	702136

7.3.10 FACTORY PART NUMBERS, MODEL 345-AMX

SUB-ASSEMBLY	FACTORY PART No.
Control/Metering PCB:	134170
Input Filter PCB:	134175
Voltage Amplifier PCB:	134171 or 134176
Input Filter PCB:	134177
External Sense Filter PCB:	134178
Output Filter PCB:	134179
LED Display PCB:	139071
Power Amplifier PCB:	139670

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716053
Front Panel Handle:	702113
Trunk Handle:	702128
Input Terminal Block:	705009
Output Terminal Block:	705009
External Sense Terminal Block:	705067
Magnetics Module Bypass-Conn. Housing (J20):	714068
Panel-Mount Magnetics Module Connector (P20):	714185
Input Transformer:	531322
Input Power Supply Bridge Rectifier:	743001
Input Power Supply High Voltage DC Capacitor:	720219-10
Output Contactor:	717043
Power Amplifier Fan:	702139
Input Transformer Fan:	702136

7.3.11 FACTORY PART NUMBERS, MODEL 360-AMX

SUB-ASSEMBLY	FACTORY PART No.
Control/Metering PCB:	134170
Input Filter PCB:	134175
Voltage Amplifier PCB:	134171 or 134176
Input Filter PCB:	134177
External Sense Filter PCB:	134178
Output Filter PCB:	134179
Power Amplifier PCB:	134477
LED Display PCB:	139071

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716053
Front Panel Handle:	702113
Trunk Handle:	702128
Input Terminal Block:	705009
Output Terminal Block:	705009
External Sense Terminal Block:	705067
Magnetics Module Bypass-Conn. Housing (J20):	714068
Panel-Mount Magnetics Module Connector (P20):	714185
Input Transformer:	531322
Input Power Supply Bridge Rectifier:	743001
Input Power Supply High Voltage DC Capacitor:	720219-10
Output Contactor:	717043
Power Amplifier Fan:	702139
Input Transformer Fan:	702136

7.3.12 FACTORY PART NUMBERS, MODEL 390-AMX

SUB-ASSEMBLY	FACTORY PART No.
Control/Metering PCB:	134170
Input Filter PCB:	134175
Voltage Amplifier PCB:	134171 or 134176
Input Filter PCB:	134177
External Sense Filter PCB:	134178
Output Filter PCB:	134179
LED Display PCB:	139071
Power Amplifier PCB:	139670

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716053
Front Panel Handle:	702113
Trunk Handle:	702128
Input Terminal Block:	705009
Output Terminal Block:	705006
Output Terminal Block End Section:	705007
External Sense Terminal Block:	705068
Magnetics Module Bypass-Conn. Housing (J20):	714068
Panel-Mount Magnetics Module Connector (P20):	714185
Input Transformer:	531322
Input Power Supply Bridge Rectifier:	743001
Input Power Supply High Voltage DC Capacitor:	720219-10
Output Contactor:	717043
Power Amplifier Fan:	702139
Input Transformer Fan:	702136

7.3.13 FACTORY PART NUMBERS, MODEL 3120-AMX

SUB-ASSEMBLY	FACTORY PART No.
Control/Metering PCB:	134170
Input Filter PCB:	134175
Voltage Amplifier PCB:	134171 or 134176
Input Filter PCB:	134177
External Sense Filter PCB:	134178
Output Filter PCB:	134179
Power Amplifier PCB:	134477
LED Display PCB:	139071

CHASSIS COMPONENT	FACTORY PART No.
Input Circuit Breaker:	716053
Front Panel Handle:	702113
Trunk Handle:	702128
Input Terminal Block:	705009
Output Terminal Block:	705006
Output Terminal Block End Section:	705007
External Sense Terminal Block:	705068
Magnetics Module Bypass-Conn. Housing (J20):	714068
Panel-Mount Magnetics Module Connector (P20):	714185
Input Transformer:	531322
Input Power Supply Bridge Rectifier:	743001
Input Power Supply High Voltage DC Capacitor:	720219-10
Output Contactor:	717043
Power Amplifier Fan:	702139
Input Transformer Fan:	702136

SECTION 8

UMC-31 CONTROLLER

8.0 UMC-31 CONTROLLER

This section describes the UMC-31 Manual Controller and is written to provide the information required to use this controller effectively. Installation, operation, and calibration are principal subjects of this section.

8.1 GENERAL PRODUCT DESCRIPTION

The UMC-31 Controller is a manually controlled, precision, three phase, sine-wave oscillator. It is capable of generating frequencies from 45 - 500 Hz, in single, two, or three phase mode. The user may select one of three fixed or the variable frequency range via internal jumpers. Fixed frequency settings are crystal-controlled to provide extremely stable operation.

Full parameter metering is provided by the UMC-31 Controller. Output volts (line-to-line and line-to-neutral), output current, and output frequency are measured by the metering circuits of the UMC-31 Controller. The meter is a 3½ digit LED type. Typical accuracy of the meter circuits is 0.5%.

Current compensation is also provided for use with transformer-coupled outputs. This feature allows the user to compensate for real losses due to distribution lines. Current compensation can be disabled at the user's discretion.

The UMC-31 Controller is one of several designed for use with the AMX-Series AC Power Source. It is completely interchangeable with all other AMX-Series controllers.

8.2 UMC-31 SPECIFICATIONS

This section states the electrical specifications of the UMC-31 Controller.

8.2.1 OUTPUT FREQUENCY

The UMC-31 Controller is configured with three fixed frequency settings and one variable frequency range. One of the above is selected via Printed Circuit Board (PCB) jumper placement. Accuracy and stability are stated below.

FIXED FREQUENCY

Fixed frequencies of the UMC-31 Controller are crystal controlled. The standard fixed frequencies are:

1)	50.0 Hz
2)	60.0 Hz
3)	400.0 Hz

Accuracy:	0.01%
Stability:	Less than 5 ppm/°C

VARIABLE FREQUENCY

The UMC-31 Controller is configured with a continuously variable frequency range. The output is controlled by a front panel 10-turn potentiometer.

Adjustment Range:	45 to 500 Hz.
Accuracy:	0.5%
Stability:	Less than 200 ppm/°C

8.2.2 OUTPUT VOLTAGE

Voltage control of the UMC-31 Controller is continuously variable via a front panel 10 turn potentiometer. This control adjusts all three phases simultaneously. Balance controls (±10% adjustment range) are provided for Phases B and C.

Output Voltage Range:

VR1:	0 to 135 $VAC_{l\text{-}n}$
VR1.5:	0 to 204 $VAC_{l\text{-}n}$
VR2.0:	0 to 273 $VAC_{l\text{-}n}$
VR2.5:	0 to 341 $VAC_{l\text{-}n}$

NOTE: VR1.5, VR2.0, and VR2.5 Output Ranges are available on transformer-coupled units only.

8.2.3 OUTPUT WAVEFORM

The UMC-31 Controller produces sine-wave output.

Distortion: Less than 0.5% THD (0.3%, typical) at the output of the controller.

8.2.4 OUTPUT FORMS

The UMC-31 Controller is suitable for use as a single, two, or three phase controller. Output form is selected via PCB jumper placement.

Single Phase Output:
Configured by using only ϕA output.

Two Phase Output:
Defined to be Phase B separated from Phase A by 180°, and both vectors equal in magnitude. This mode is also available via PCB jumper placement. This form is also commonly referred to as "Split-Phase".

Three Phase Output:
Defined to be three independent vectors separated equally (ϕB lags ϕA by 120°; ϕC lags ϕA by 240°).

Phase Separation Accuracy: ± 1°

8.2.5 OUTPUT METERING

The UMC-31 Controller is configured with a 3½ digit LED panel meter. A Meter Select Switch is used to select either line-to-line voltage, line-to neutral voltage, phase current, or output frequency.

OUTPUT VOLTAGE

Three voltmeter inputs are accommodated from the Power Source, one per phase. Phase to phase voltages may also be measured. Voltage metering is average responding, rms indicating.
Range selection is automatic.

RANGE	RESOLUTION
0 ≈ 180 VAC_{rms}	0.1 VAC_{rms}
180 ≈ 600 VAC_{rm}	1 VAC_{rms}

Accuracy is ± 0.5% of full scale for each range.

OUTPUT CURRENT

Four ammeter inputs are provided, one per phase and neutral.

Range selection is automatic.

RANGE	RESOLUTION
0 ≈ 180 A_{rms}	0.1 A_{rms}
180 ≈ 700 A_{rms}	1 A_{rms}

Accuracy is ± 0.5% of full scale for each range.

OUTPUT FREQUENCY

A frequency meter is provided to measure the output frequency of the UMC-31 Controller

Range 45 - 500 Hz.

Range selection is automatic.

RANGE	RESOLUTION
0 ≈ 180 Hz	0.1 Hz
180 ≈ 550 Hz	1 Hz

Accuracy is ± 0.5% of full scale for each range.

NOTE: The frequency meter measures the output of the local oscillator of the UMC-31. As a result, the frequency of an externally induced signal is not measured by the frequency meter of the UMC-31.

8.2.6 ISOLATION

The circuits of the UMC-31 are connected to equipment ground for the purpose of operator safety.

Metal knobs and manual controls are electrically connected to chassis to prevent operator shock hazard. (Requires the CHS terminal of the AMX-Series power source to be connected to earth ground for complete operator safety.)

8.2.7 ENVIRONMENTAL

Temperature Range:	0 to +55°C, Operating -20 to +75°C, Storage
Humidity Range:	0 to 95% RH, non condensing.

8.3 UMC-31 INSTALLATION

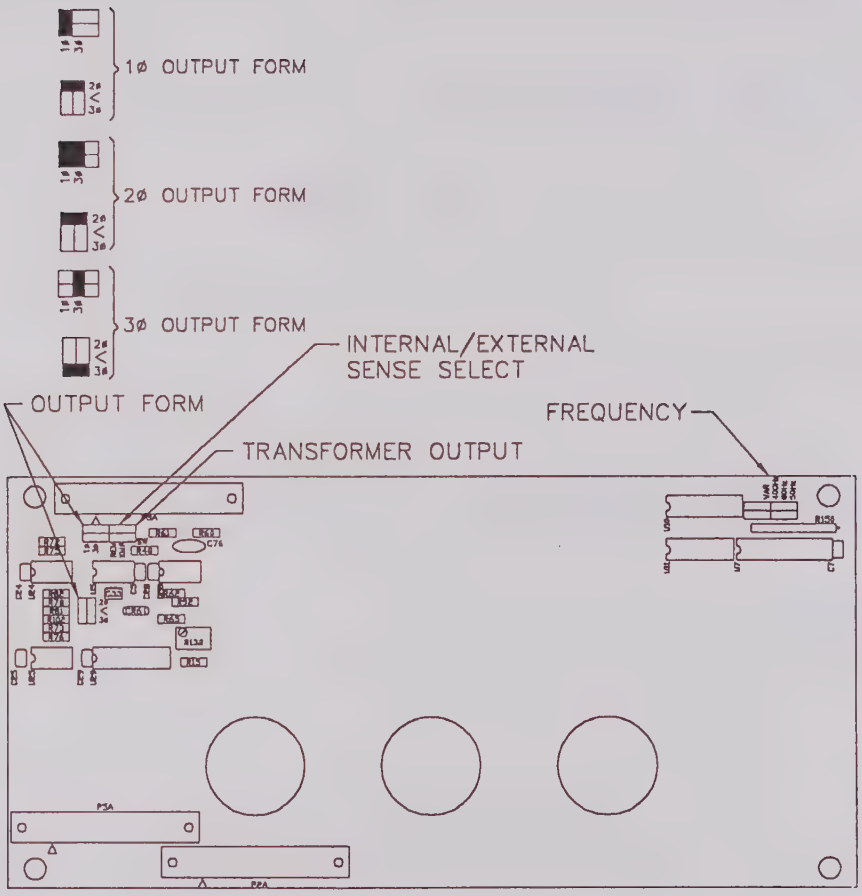
This section describes the installation of the UMC-31 into an AMX-Series chassis assembly.

The UMC-31 is designed to be installed into an AMX-Series Power Source. This controller must be configured and calibrated when installed because signal levels (primarily I_{out} meter signals) are not the same for the various AMX Power Sources.

8.3.1 REMOVE EXISTING CONTROLLER

Remove the existing controller, if present, as follows:

1. Remove all input power.
2. Remove the top cover from the chassis.
3. While leaving all cabling attached to the existing Power Source or stand alone controller chassis, remove all cabling from the existing controller. Do not remove cabling which does not leave the controller.
4. Remove the two nuts that mount the controller to the chassis front panel.
5. Lift the controller up and slip it over the front panel studs. Remove the controller from the chassis.



REAR VIEW

UMC-31 PCB ASSY

FIGURE 8.3.2 UMC-31 CONFIGURATION JUMPER LOCATIONS

8.3.2 CONFIGURE THE NEW CONTROLLER

Jumpers must be installed for desired operation. See Figure 8.3.2 for the location of the various configuration jumpers.

SET OUTPUT FREQUENCY

Place a jumper on either the **50 Hz**, **60 Hz**, **400 Hz**, or **VAR** header to select the desired frequency.

SET OUTPUT FORM

For 1ϕ operation, place jumpers on the **1ϕ** and **2ϕ** headers. Remove jumpers from both **3ϕ** headers and the "<" header.

For 2ϕ operation, place jumpers on the **1ϕ**, **2ϕ**, and on the **3ϕ** header near P3A. Remove jumpers from the "<" and **3ϕ** header near U5.

For 3ϕ operation, place jumpers on both **3ϕ** headers. Remove jumpers from the **1ϕ**, **2ϕ** and "<" headers.

8.3.2 CONFIGURE THE NEW CONTROLLER (cont.)

SET for DIRECT or TRANSFORMER OUTPUT

To force direct-coupled output, remove jumpers from the **XMR** and **SW** headers.

To force transformer-coupled output, place a jumper on the **XMR** header. Remove jumper from the **SW** header.

To allow the front panel switch to select direct or transformer-coupled output, place a jumper on the **SW** header. Remove jumper from the **XMR** header.

SET OUTPUT METERING FOR INTERNAL OR EXTERNAL SENSE

The output metering circuits of the UMC-31 can be set to measured output parameters at one of two points. The first is **INTERNAL** Sense which measures at the output terminals of the system. The second is **EXTERNAL** Sense where the user installs leads from some externally located sense point to the External Sense Terminal Block on the power source chassis (ref. paragraph 3.8). Note that when external sense is used, the output voltmeter will read zero volts when the output contactor of the power source is open.

To configure for internal sense, remove jumper from the **REM** header.

To force external sense, install a jumper on the **REM** header.

8.3.3 INSTALL THE NEW CONTROLLER

Installation of the UMC-31 Controller is as follows:

1. Remove all input power.
2. Remove the top cover from the chassis.
3. Attach cabling from the Power Source or stand alone controller chassis to the controller. Connect J2A to P2A, J3A to P3A, J5A to P5A, and J6A to P6A.
4. Insert the controller behind the front panel of the chassis and onto the two front panel studs.
5. Insert two nuts onto the front panel studs and tighten.
6. Calibrate the controller as per paragraph 8.5.
7. Install the top cover.

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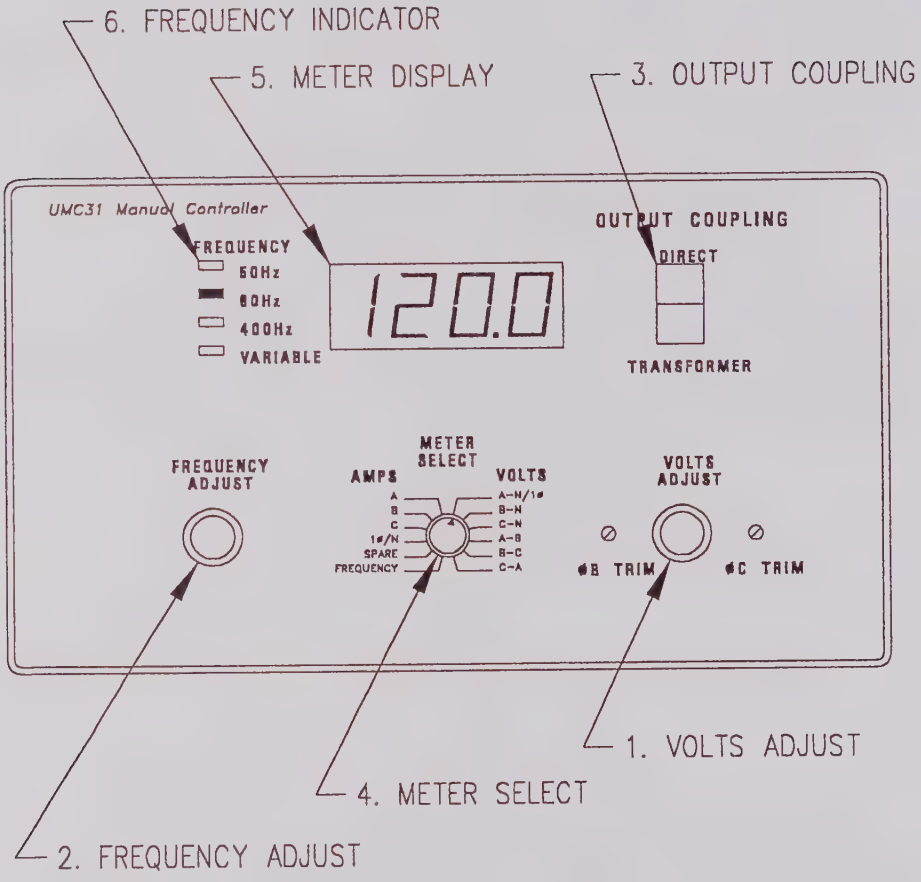

FIGURE 8.4.1 UMC-31 FRONT PANEL CONTROLS

8.4 UMC-31 OPERATION

This section provides the information required to operate the UMC-31 Controller. Refer to Section 4 of this manual for general power source operating instructions.

8.4.1 UMC-31 CONTROLS AND INDICATORS (Refer to Figure 4.1)

1. **VOLTS ADJUST**

   The **VOLTS ADJUST** controls the internal oscillator output voltage. The center control is for all three output phases. **ϕB** and **ϕC TRIM** are for phase B and phase C voltage trim adjustments only. These controls work all of the time.

2. **FREQUENCY ADJUST**

   The **FREQUENCY ADJUST** controls the internal oscillator output frequency in variable frequency mode only. This control is disabled when the UMC-31 is configured for one of the fixed frequency outputs.

3. **OUTPUT COUPLING**

   The **OUTPUT COUPLING** switch selects **DIRECT** or **TRANSFORMER** coupled output if enabled by internal jumpers.

4. **METER SELECT**

   The **METER SELECT** switch selects a metering function. The user can select line-to-line voltage, line-to-neutral voltage, phase or neutral current, or frequency as the output parameter to be metered.

5. **METER DISPLAY**

   The **METER DISPLAY** indicates volts, amps, or frequency as selected by the Meter Select switch.

6. **FREQUENCY INDICATOR**

   The **FREQUENCY INDICATOR** lamps show which output frequency mode has been configured.

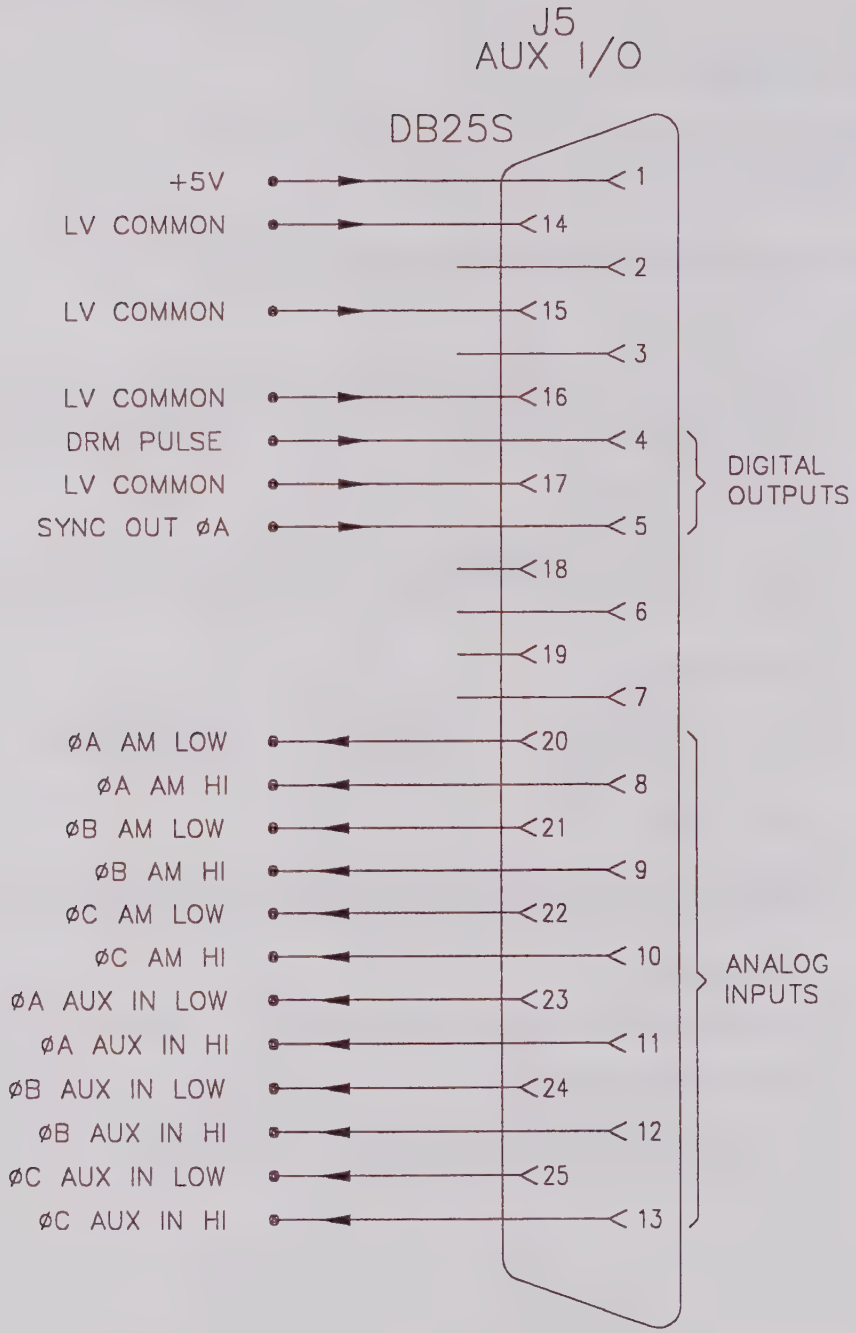

FIGURE 8.4.2 UMC-31 J5 AUX I/O CONNECTOR

8.4.2 UMC-31 AUXILIARY INPUTS

Refer to Figure 4.3.2 for the pin-out of J5.

Three AUX Inputs are provided on J5, one per phase. J5 is located on the back panel of the AMX Power Source. Input impedance of the AUX inputs is 600 ohms. The low side of these signals is tied directly to power supply common (equipment ground). The inputs are DC coupled and are algebraically summed to the oscillator outputs of the UMC-31. It should be noted that the AUX Inputs can be used as external inputs simply by setting the UMC-31 to 0 VAC output. The AUX Inputs have a voltage gain of 25 with respect to direct-coupled, power source output (5.00 $VAC_{AUX\,IN}$ = 125 VAC_{OUT}). The gain of these inputs is scaled appropriately when transformer outputs are used.

Three AM (Amplitude Modulation) inputs are also provided on J5, one per phase. As stated above, J5 is located on the rear panel of the AMX Power Source chassis. The input impedance of the AM Inputs is also 600 ohms. The low side of these signals is tied directly to power supply common. A varying DC voltage is used to modulate the output. A 0 to +5 VDC will cause a 0 to 100% increase in output voltage. A 0 to -5 VDC will cause a 0 to 100% decrease in output voltage.

8.4.3 UMC-31 DIGITAL OUTPUTS

Refer to Figure 4.3.2 for the pin-out of J5.

Digital outputs on J5 are 0 to 5 VDC, positive logic. J5 is located on the rear panel of the AMX Power Source. These signals are provided for the purpose of synchronizing test equipment to the output of the power source.

Logic outputs are provided for Sync Output of ϕA analog output, and the DRM pulse which is 100 times the output frequency.

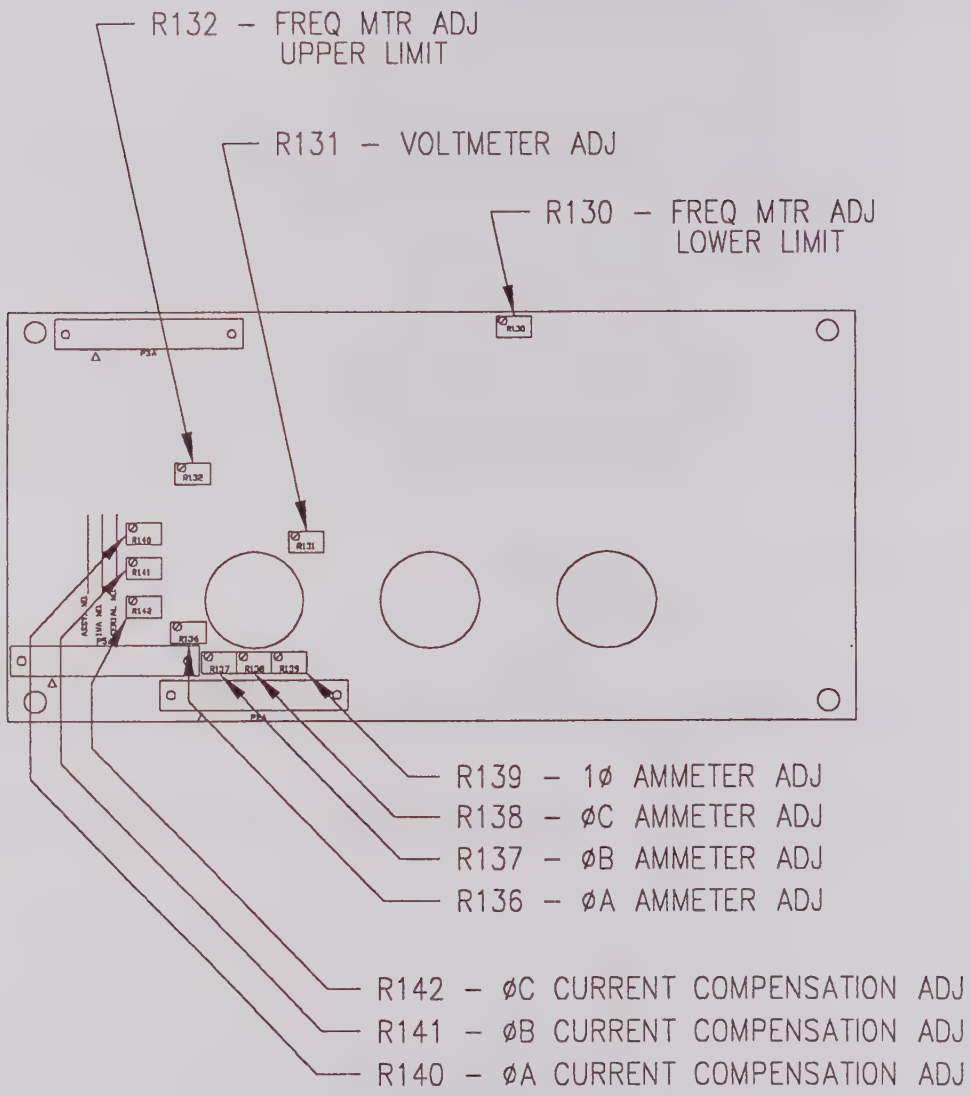
R132 – FREQ MTR ADJ
UPPER LIMIT
R131 – VOLTMETER ADJ
R130 – FREQ MTR ADJ
LOWER LIMIT
R139 – 1ø AMMETER ADJ
R138 – øC AMMETER ADJ
R137 – øB AMMETER ADJ
R136 – øA AMMETER ADJ
R142 – øC CURRENT COMPENSATION ADJ
R141 – øB CURRENT COMPENSATION ADJ
R140 – øA CURRENT COMPENSATION ADJ
REAR VIEW
UMC-31 PCB ASSEMBLY

FIGURE 8.5 UMC-31 CALIBRATION ADJUSTMENT LOCATIONS

8.5 UMC-31 CALIBRATION

This section provides the information required to calibrate the UMC-31. The controller **must** be calibrated in the sequence stated below. Improper operation will result if the operations stated below are performed out of order.

CALIBRATE OUTPUT FREQUENCY

Configure for 50 Hz, fixed frequency operation. See paragraph 8.3.2.
Attach a frequency counter to the output of the Power Source and verify that the output frequency is 50 Hz ± 0.005 Hz.

Configure for 60 Hz, fixed frequency operation.
Verify output frequency is 60 Hz ± 0.006 Hz.

Configure for 400 Hz, fixed frequency operation.
Verify output frequency is 400 Hz ± 0.04 Hz.

Configure for variable frequency operation.
Turn the Frequency Adjust control fully counterclockwise.
Verify that the output frequency is less than 45 Hz.
Turn the Frequency Adjust control fully clockwise.
Verify that the output frequency is greater than 500 Hz.

If any of the above tests fail, return the unit for repair.

CALIBRATE FREQUENCY METER

Configure for 50 Hz, fixed frequency operation. See paragraph 8.3.2.
Rotate the Meter Select switch to the Frequency position.
Adjust R130 (ref. Figure 8.5) until the meter indicates 50.0.
Configure for 400 Hz, fixed frequency operation.
Adjust R132 (ref. Figure 8.5) until the meter indicates 400.

If any of the above tests fail, return the unit for repair.

CALIBRATE VOLTMETER

NOTE: The Frequency Meter **MUST** be properly calibrated **BEFORE** the voltmeter calibration is performed. Any time the Frequency Meter is calibrated, the voltmeter must also be re-calibrated.

Configure for 60 Hz, fixed frequency, 3ϕ, direct-coupled operation (ref. paragraph 8.3.2).
Rotate the Meter Select switch to the VOLTS A-N/1ϕ position.
Connect a 4½ digit voltmeter from the ϕA output to neutral of the Power Source.
Adjust the volts adjust control so that the 4½ digit voltmeter indicates 120.00.
Adjust R131 (ref. Figure 8.5) until the UMC-31 meter indicates 120.0.

8.5 UMC-31 CALIBRATION (cont.)

CALIBRATE AMMETER

NOTE: The Frequency Meter **MUST** be properly calibrated **BEFORE** the ammeter calibration is performed. Any time the Frequency Meter is calibrated, the ammeter must also be re-calibrated.

In order to accommodate the wide range of CT ratios of the AMX product line, the CT ratio must be set in the UMC-31 to the Power Source current ratio. This is done by four trim-pots within the controller designated R136 through R139. These must be set, at the factory or in the field, to agree to the Power Source CT ratio.

Rotate the Meter Select switch to the AMPS A position.
Connect a 4½ digit current meter in series with the ϕA output of the Power Source.
Apply a full-rated resistive load to ϕA.
Adjust R136 (ref, Figure 8.5) until the UMC-31 meter indicates the same current as the 4½ digit current meter.

Rotate the Meter Select switch to the AMPS B position.
Connect a 4½ digit current meter in series with the ϕB output of the Power Source.
Apply a full-rated resistive load to ϕB.
Adjust R137 (ref, Figure 8.5) until the UMC-31 meter indicates the same current as the 4½ digit current meter.

Rotate the Meter Select switch to the AMPS C position.
Connect a 4½ digit current meter in series with the ϕC output of the Power Source.
Apply a full-rated resistive load to ϕC.
Adjust R138 (ref, Figure 8.5) until the UMC-31 meter indicates the same current as the 4½ digit current meter.

Configure the UMC-31 Controller for 1ϕ operation.
Rotate the Meter Select switch to the AMPS 1ϕ/N position.
Connect a 4½ digit current meter in series with the 1ϕ output of the Power Source. Apply a full rated resistive load to the 1ϕ output.
Adjust R139 until the UMC-31 meter indicates the same current as the 4½ digit current meter.

8.5 UMC-31 CALIBRATION (cont.)

CALIBRATE CURRENT COMPENSATION

Current compensation is used by the UMC-31 to compensate for real losses due to output transformers. Current compensation is active only when the system is configured for transformer-coupled output. This step in the procedure can be performed only when the system is supplied with output transformers.

NOTE: The Output Ammeter **MUST** be properly calibrated **BEFORE** calibration of Current Compensation is performed. Any time the Ammeter is calibrated, Current Compensation must also be re-calibrated.

Configure for 60 Hz, 3ϕ, transformer-coupled operation.
With no load attached, set ϕA output to desired voltage.
Apply full-rated load to ϕA.
Adjust R140 until the full load output voltage is the same as the no load output voltage.

With no load attached, set ϕB output to desired voltage.
Apply full-rated load to ϕB.
Adjust R141 until the full load output voltage is the same as the no load output voltage.

With no load attached, set ϕC output to desired voltage.
Apply full-rated load to ϕC.
Adjust R142 until the full load output voltage is the same as the no load output voltage.

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SECTION 9

MODIFICATIONS AND CHANGE NOTICES

9.0 MODIFICATIONS AND CHANGE NOTICES

In cases where customer specified modifications have been installed in the equipment, the modifications will be described on the following pages. If present, be sure to notice any special instructions relative to operation and calibration of the system.

Product change notices or manual errata will also be placed in this section.

ERRATA
FOR THE
AMX-SERIES OPERATION MANUAL
DOCUMENT 139250

8/25/97

The following lists changes to the manual. The information which follows takes precedence over that originally given.

NOTE ON ETL LISTED SYSTEMS, Models 105, 108, 112, 305, 308, and 312-AMX:
An Input Power Cord plug is now provided since ETL/UL considers these models to be of the "portable" class. Use of a UL listed plug is mandatory in maintaining listed status.

If the provided plug does not match the service outlet to be used, a UL listed plug of applicable voltage form and current rating may be substituted (see paragraph **2.1.1 INPUT POWER REQUIREMENTS** and related errata in this document.)

NOTE ON ETL LISTED SYSTEMS, Models 125, 140, 345, 360, 390, and 3120-AMX:
The Input Terminal Block cover is now provided since ETL/UL considers these models to be of the "permanently connected" class. Use of the cover is mandatory in maintaining listed status.

"Knock-outs" are provided for wiring to the Input Terminal Block.

PAGE 7; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 105-AMX
PAGE 8; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 108-AMX
PAGE 10; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 305-AMX
PAGE 10; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 308-AMX
Changes due to ETL listing and CE-mark requirements, all four models. Service Recommended matched to Input Circuit Breaker amperage rating.

WAS:	V_{in}	INPUT CURRENT
1)	110VAC	9 A_{rms}; 20 A Service Recommended
2)	120VAC	8 A_{rms}; 20 A Service Recommended
IS:	V_{in}	INPUT CURRENT
1)	110VAC	9 A_{rms}; 25 A Service Recommended
2)	120VAC	8 A_{rms}; 25 A Service Recommended

PAGE 9; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 140-AMX
PAGE 12; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 345-AMX
Changes due to ETL listing and CE-mark requirements, both models. Service Recommended matched to Input Circuit Breaker amperage rating.

WAS:	V_{in}	INPUT CURRENT
1)	208 VAC Δ	21 A_{rms}; 30 A Service Recommended
2)	220 VAC Δ	20 A_{rms}; 30 A Service Recommended
3)	240 VAC Δ	18 A_{rms}; 30 A Service Recommended
IS:	V_{in}	INPUT CURRENT
1)	208 VAC Δ	21 A_{rms}; 40 A Service Recommended
2)	220 VAC Δ	20 A_{rms}; 40 A Service Recommended
3)	240 VAC Δ	18 A_{rms}; 40 A Service Recommended

PAGE 11; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 320-AMX

Changes due to ETL listing and CE-mark requirements. Service Recommended matched to Input Circuit Breaker amperage rating.

WAS:	V_{in}	INPUT CURRENT
4)	220/380 VAC	6 A_{rms}; 10 A Service Recommended
5)	240/416 VAC	5 A_{rms}; 10 A Service Recommended
6)	277/480 VAC	5 A_{rms}; 10 A Service Recommended
IS:	V_{in}	INPUT CURRENT
4)	220/380 VAC	6 A_{rms}; 15 A Service Recommended
5)	240/416 VAC	5 A_{rms}; 15 A Service Recommended
6)	277/480 VAC	5 A_{rms}; 15 A Service Recommended

PAGE 13; PARAGRAPH 2.1.1 INPUT POWER REQUIREMENTS, MODEL 390-AMX

Changes due to ETL listing and CE-mark requirements. Service Recommended matched to Input Circuit Breaker amperage rating.

WAS:	V_{in}	INPUT CURRENT
1)	208 VAC Δ	42 A_{rms}; 60 A Service Recommended
2)	220 VAC Δ	39 A_{rms}; 60 A Service Recommended
3)	240 VAC Δ	36 A_{rms}; 60 A Service Recommended
IS:	V_{in}	INPUT CURRENT
1)	208 VAC Δ	42 A_{rms}; 80 A Service Recommended
2)	220 VAC Δ	39 A_{rms}; 80 A Service Recommended
3)	240 VAC Δ	36 A_{rms}; 80 A Service Recommended

PAGE 106; PARAGRAPH 7.3.1 FACTORY PART NUMBERS, MODEL 105-AMX
PAGE 107; PARAGRAPH 7.3.2 FACTORY PART NUMBERS, MODEL 108-AMX
PAGE 107; PARAGRAPH 7.3.3 FACTORY PART NUMBERS, MODEL 112-AMX
PAGE 110; PARAGRAPH 7.3.6 FACTORY PART NUMBERS, MODEL 305-AMX
PAGE 110; PARAGRAPH 7.3.7 FACTORY PART NUMBERS, MODEL 308-AMX
PAGE 111; PARAGRAPH 7.3.8 FACTORY PART NUMBERS, MODEL 312-AMX

Changes due to ETL listing and CE-mark requirements, all six models.

WAS:	**CHASSIS COMPONENT**	**FACTORY PART No.**
(1 Pole C/B)	Input Circuit Breaker:	716061
IS:	**SUB-ASSEMBLY**	**FACTORY PART No.**
	LVPS Fuse PCB:	140373 (New)
	CHASSIS COMPONENT	**FACTORY PART No.**
(2 Pole C/B)	Input Circuit Breaker:	716070 (110, 120VAC Input Forms)
(2 Pole C/B)	Input Circuit Breaker:	716075 (220, 230, 240VAC Input Forms)
	External Sense Terminal Block Cover:	705081 (New)
	Output Terminal Block Cover:	705082 (New)

PAGE 108; PARAGRAPH 7.3.4 FACTORY PART NUMBERS, MODEL 125-AMX

Changes due to ETL listing and CE-mark requirements.

WAS:	**CHASSIS COMPONENT**	**FACTORY PART No.**
	Input Circuit Breaker:	716059
	Input and Output Terminal Blocks:	705009
IS:	**SUB-ASSEMBLY**	**FACTORY PART No.**
	LVPS Fuse PCB:	140374 (New)
	CHASSIS COMPONENT	**FACTORY PART No.**
	Input Circuit Breaker:	716077 (208, 220, 240VACΔ Input Forms)
	Input Circuit Breaker:	716074 (220/380, 240/416VAC Input Forms)
	Input and Output Terminal Blocks:	705080
	Input Terminal Block Cover:	143315 (New)

PAGE 108; PARAGRAPH 7.3.5 FACTORY PART NUMBERS, MODEL 140-AMX
PAGE 112; PARAGRAPH 7.3.10 FACTORY PART NUMBERS, MODEL 345-AMX
PAGE 113; PARAGRAPH 7.3.11 FACTORY PART NUMBERS, MODEL 360-AMX

Changes due to ETL listing and CE-mark requirements; all three models.

WAS:	**CHASSIS COMPONENT**	**FACTORY PART No.**
	Input Circuit Breaker:	716053
	Input and Output Terminal Blocks:	705009
IS:	**SUB-ASSEMBLY**	**FACTORY PART No.**
	LVPS Fuse PCB:	140374 (New)
	CHASSIS COMPONENT	**FACTORY PART No.**
	Input Circuit Breaker:	716079 (208, 220, 240VACΔ Input Forms)
	Input Circuit Breaker:	716076 (220/380, 240/416VAC Input Forms)
	Input and Output Terminal Blocks:	705080
	External Sense Terminal Block Cover:	705083 (New)
	Input Terminal Block Cover:	134125 (New)

PAGE 114; PARAGRAPH 7.3.12 FACTORY PART NUMBERS, MODEL 390-AMX
PAGE 115; PARAGRAPH 7.3.13 FACTORY PART NUMBERS, MODEL 3120-AMX

Changes due to ETL listing and CE-mark requirements; both models.

WAS:	**CHASSIS COMPONENT**	**FACTORY PART No.**
	Input Circuit Breaker:	716053
	Input Terminal Block:	705009
IS:	**SUB-ASSEMBLY**	**FACTORY PART No.**
	LVPS Fuse PCB:	140374 (New)
	CHASSIS COMPONENT	**FACTORY PART No.**
	Input Circuit Breaker:	716079 (208, 220, 240VACΔ Input Forms)
	Input Circuit Breaker:	716076 (220/380, 240/416VAC Input Forms)
	Input Terminal Block:	705080
	External Sense Terminal Block Cover:	705083 (New)
	Input Terminal Block Cover:	134125 (New)

PAGE 111; PARAGRAPH 7.3.9 FACTORY PART NUMBERS, MODEL 320-AMX

Changes due to ETL listing and CE-mark requirements.

WAS:	**CHASSIS COMPONENT**	**FACTORY PART No.**	
	Input Circuit Breaker:	716059	
	Output Terminal Block:	705009	
(black case)	Output Contactor:	717038	
IS:	**SUB-ASSEMBLY**	**FACTORY PART No.**	
	LVPS Fuse PCB:	140373	(New)
	CHASSIS COMPONENT	**FACTORY PART No.**	
	Input Circuit Breaker:	716077 (208, 220, 240VACΔ Input Forms)	
	Input Circuit Breaker:	716071 (220/380, 240/416VAC Input Forms)	
	Output Terminal Block:	705080	
	External Sense Terminal Block Cover:	705081	(New)
(clear case)	Output Contactor (Relay):	717043	

MP MASTER
MA36182